

ARIZONA GOLDEN EAGLE NEST SURVEY 2012

Kyle M. McCarty, Bald Eagle Field Projects Coordinator
Kenneth V. Jacobson, Raptor Management Coordinator
Nongame Branch, Wildlife Management Division



Photo by Meggan Dugan

Technical Report 271
Nongame and Endangered Wildlife Program
Birds and Mammals Program Manager: James Driscoll
Arizona Game and Fish Department
5000 West Carefree Highway
Phoenix, Arizona 85086

December 2012

CIVIL RIGHTS AND DIVERSITY COMPLIANCE

The Arizona Game and Fish Commission receives federal financial assistance in Sport Fish and Wildlife Restoration. Under Title VI of the 1964 Civil Rights Act, Section 504 of the Rehabilitation Act of 1973, Title II of the American with Disabilities Act of 1990, the Age Discrimination Act of 1975, and Title IX of the Education Amendments of 1972, the Arizona Game & Fish Department joins the U.S. Department of the Interior and its bureaus in prohibiting discrimination on the basis of race, color, religion, national origin, age, sex, or disability. If you believe you have been discriminated against in any program, activity, or facility as described above, or if you desire further information please write to:

Arizona Game and Fish Department
Office of the Deputy Director, DOHQ
5000 West Carefree Highway
Phoenix, Arizona 85086

Or

The Office for Diversity and Civil Rights
U.S. Fish and Wildlife Service
4040 North Fairfax Drive, Room 300
Arlington, Virginia 22203

AMERICANS WITH DISABILITIES ACT COMPLIANCE

The Arizona Game and Fish Department complies with all provisions of the Americans with Disabilities Act. This document is available in alternative format by contacting the Arizona Game and Fish Department, Office of the Deputy Director at the address listed above or by calling (623) 236-7290 or TTY 1-800-367-8939.

ACKNOWLEDGMENTS

The authors acknowledge and appreciate the assistance of the following people: Tim Hughes, U.S. Bureau of Land Management; Dan Northrop, Joe Schlehuber, and Borden Miller, Papillon Airways Inc; Ryan Babel, Bill Burger, Kyle Cooper, James Driscoll, Meggan Dugan, Jake Fousek, Dan Groebner, George Hayes, Charles Hofer, John Kraft, Shawn Lowery, Susan MacVean, Devin Skinner, and Locana de Souza, Arizona Game and Fish Department; Ruth Valencia, Salt River Project; Alex Smith, Geoff Shanen, and Mike Norton, U.S. Bureau of Reclamation.

PROJECT FUNDING

Funding for this project was provided by the U.S. Bureau of Land Management, the Arizona Game and Fish Department's Heritage Fund, and U.S. Fish and Wildlife Service (State Wildlife Grants).

RECOMMENDED CITATION

McCarty, K.M. and K.V. Jacobson. 2012. Arizona golden eagle nest survey 2012 summary report. Nongame and Endangered Wildlife Program Technical Report 271. Arizona Game and Fish Department, Phoenix, Arizona.

TABLE OF CONTENTS

Introduction.....	1
Study Area	2
Methods.....	3
Results.....	4
Surveys in Suitable Habitat	6
Historic Breeding Areas	16
Known Breeding Areas	21
Additional Golden Eagle Sightings.....	23
Bird Conservation Regions	26
Management Recommendations	28
Literature Cited	29

LIST OF TABLES

Table 1. Areas searched and flight time used in 2012 golden eagle nest surveys	4
Table 2. Summary of new breeding areas in 2012.....	14
Table 3. Summary of golden eagle sightings near large nests in 2012.....	15
Table 4. Summary of findings at historic breeding areas surveyed in 2012.....	20
Table 5. Summary of findings at known breeding areas surveyed in 2012.....	22
Table 6. Summary of additional golden eagle sightings in 2012.....	25
Table 7. Number of golden eagle breeding areas, large nests, and potential breeding areas in Arizona by Bird Conservation Region as of 2012.....	28
Table 8. Summary of potential breeding areas with large nests documented in 2012.....	32

LIST OF FIGURES

Figure 1. Aerial golden eagle nest survey area completed in Arizona in 2012.	2
Figure 2. Distribution of new large nests found in Arizona in 2012	5
Figure 3. Distribution of historic and current golden eagle breeding areas as of 2012.	6
Figure 4. Henderson and Mount Floyd breeding areas.....	9
Figure 5. Burro Cliffs and Cottonwood Cliffs North breeding areas.	10
Figure 6. Panther Point and Peacock Peak breeding areas.	11
Figure 7. Trap Spring and Wright Canyon breeding areas.	12
Figure 8. Cherry Creek and Copper Creek breeding areas.	13
Figure 9. Mohon Mountains and Picacho Butte breeding areas.	13
Figure 10. Aerial golden eagle nest surveys completed in 2011 and 2012 in relation to Bird Conservation Regions and tribe lands.....	27

LIST OF APPENDICES

Appendix A: Raptor Reproductive Status Criteria	31
Appendix B: Potential Breeding Areas Documented in 2012 Nest Survey.....	32

ARIZONA GOLDEN EAGLE NEST SURVEY 2012

Kyle M. McCarty and Kenneth V. Jacobson

INTRODUCTION

In 1940, Congress passed the Bald Eagle Protection Act in an effort to provide protection for declining bald eagle populations (*Haliaeetus leucocephalus*). In 1962, the Act was amended to include golden eagles (*Aquila chrysaetos*), becoming the Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668-668d, 54 Stat. 250). The BGEPA was modeled after the Migratory Bird Treaty Act of 1918 and contains similar language to protect birds, eggs, and nests.

With the removal of the bald eagle from the list of threatened and endangered species under the Endangered Species Act (ESA) in 2007, the BGEPA became the primary law protecting that species. At the same time as the delisting proposal, and as a means of facilitating post-delisting management of bald eagles, the U.S. Fish and Wildlife Service (USFWS) also codified the definition of “disturb” under the BGEPA. Disturbance includes an action that “causes, or is likely to cause...injury to an eagle” or interference with “normal breeding, feeding, or sheltering behavior” causing a decrease in productivity or nest abandonment (USFWS 2007a). Unlike the ESA there was no mechanism for permitted take (USFWS 2007a, b) and in 2009 the USFWS finalized regulations to provide a mechanism to authorize take (USFWS 2009). In addition to the BGEPA, golden eagles are protected under the Migratory Bird Treaty Act, Lacey Act, Airborne Hunting Act, and the Convention on International Trade in Endangered Species of Wild Flora and Fauna and under Arizona Revised Statute Title 17.

Few long-term studies have been undertaken on golden eagle populations in North America (Kochert and Steenhof 2002, Kochert et al. 2002). Braun et al. (1975) proposed as many as 100,000 individuals in North America in the 1970s. Olendorff et al. (1981), using data from USFWS aerial transect surveys in 1974-1978 and other data sources, estimated the wintering population of golden eagles in the western U.S. at 63,242 birds, with a potential 20,500 North American breeding pairs. Watson (1997) estimated the number of breeding pairs at 20,000-25,000 in North America. More recently, in 2003 the USFWS contracted with Western EcoSystems Technology, Inc. to complete golden eagle aerial line transect surveys across much of the species’ range in the western United States, with an estimated 27,392 golden eagles within the entire study area (Good et al. 2004, 2007). The surveys were expanded and repeated in 2006-2011, and estimates ranged from 18,858 to 24,206 total golden eagles within the study area (Nielson et al. 2012). Given the limitations of short-term survey data, the USFWS has cautiously estimated a population of up to 30,000 golden eagles across the U.S. (USFWS 2011).

In Arizona, information on breeding golden eagles is also limited. Studies have reported on golden eagle productivity in west-central Arizona (Millsap 1981), prey remains in nests (Eakle and Grubb 1986), and nest structure (Grubb and Eakle 1987). The Arizona Breeding Bird Atlas (Corman and Wise-Gervais 2005) found possible, probable, or confirmed evidence of breeding golden eagles in 187 of 1,834 (10.2%) priority blocks. Additional data was gathered during a 2006 Arizona Game and Fish Department (AGFD) survey effort, which found 14 occupied nests

among 85 surveyed locations that had been identified as historic or current breeding areas. The 2006 survey protocol, however, was limited to only 2 visits, in mid-April and mid-June, so occupancy-only and early failures were likely missed (AGFD unpublished data).

In 2011, the Bureau of Land Management (BLM) funded AGFD to conduct a two-year baseline golden eagle nest survey to inventory potential nest sites primarily within and adjacent to proposed wind and solar energy project areas. That year, we surveyed suitable habitat via helicopter in project areas in western and northern Arizona, visiting 29 historic or current breeding areas, and finding 17 new breeding areas and 134 potential breeding areas (McCarty and Jacobson 2011). Here, we report on the results of the 2012 survey.

STUDY AREA

In 2012, helicopter surveys were conducted in portions of every county except Yuma, surrounding and within proposed renewable energy project areas (Figure 1).

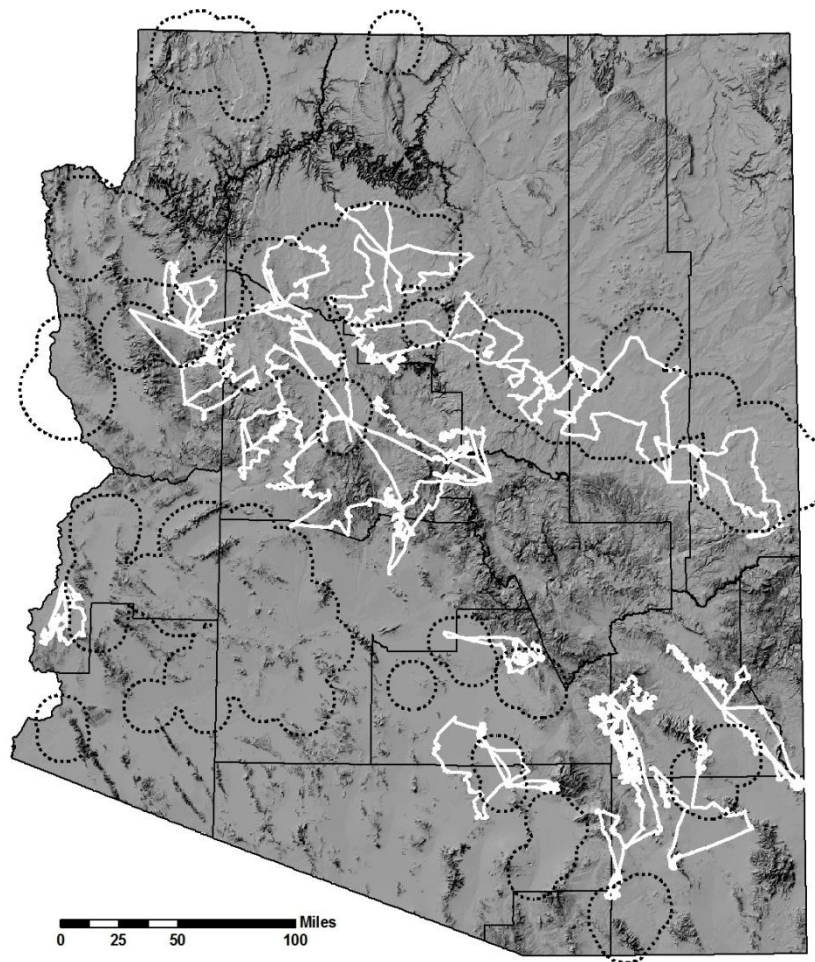


Figure 1. Aerial golden eagle nest survey area completed in Arizona in 2012, showing raw flight tracks (solid lines) and renewable energy project areas with 10-mile, overlapping buffers (dashed outlines).

The survey area was diverse in habitat, characterized by nine biotic communities. The southwestern portion of the survey, a section of the Yuma Proving Ground, was exemplified by Sonoran Desertscrub [Lower Colorado River Valley subdivision] with low mountain ranges (<3,000 ft) and sparse vegetation (Brown 1994). The area surveyed in southeastern Arizona varied but mainly included Sonoran Desertscrub [Arizona Upland subdivision], Semidesert Grassland, Madrean Evergreen Woodland, and Interior Chaparral, with minor elements of Chihuahuan Desertscrub, Plains and Great Basin Grassland, Great Basin Conifer Woodland, and Rocky Mountain (Petran) Montane Conifer Forest. North of the Mogollon Rim, from Springerville northwest toward Flagstaff, the landscape was relatively flat with buttes, outcrops, cinder cones, and shallow canyons providing cliff substrate. This area consisted mainly of Plains and Great Basin Grassland, and Great Basin Conifer Woodland, with minor elements of Rocky Mountain (Petran) Montane Conifer Forest and Great Basin Desertscrub. The remainder of the surveyed area, from Flagstaff west to the Peacock Mountains near Kingman and south through Yavapai County, covered portions of seven of these communities. Elevations throughout the survey ranged from 137 m (450 ft) at the Colorado River to 2,713 m (8,900 ft) in the White Mountains.

METHODS

We prioritized survey effort to include lands administered by the BLM and adjacent lands that contained proposed wind or solar energy development projects, excluding those we surveyed in 2011. These lands were often intermingled with private or state trust properties, and a significant amount of flight time was used over lands managed by the U.S. Forest Service, Arizona State Land Department, U.S. Department of Defense (Yuma Proving Ground), and private landowners. Efforts were focused on cliff nest surveys within a 10 mile radius of each proposed project and as much of the surrounding suitable nesting habitat as possible. Due to limited flight time we excluded heavily forested areas and did not search for tree nests.

Suitable cliff nest habitat was coarsely identified using ArcMap™ (ESRI) to calculate slopes greater than 40 degrees. In addition, we compiled and reviewed data on sightings of golden eagles or nests from various state and federal agencies and AGFD's Heritage Database Management System to identify specific areas of interest.

The greatest challenge to detecting golden eagle nests is the remote and often inaccessible terrain in which they occur. Helicopters are an indispensable tool for surveying bald eagle nests in similar habitat throughout Arizona (e.g., McCarty and Jacobson 2010) and served as the primary search method within this survey. A two to three-person team conducted helicopter surveys between January and May 2012. At least one observer was an AGFD biologist with five or more years of experience in helicopter searches for cliff-nesting eagles. The pilots had extensive experience in flying low-level wildlife surveys in Arizona, including our golden eagle nest surveys last year. Helicopters flew at approximately 60 meters (200 ft) above ground level and at 50-60 knots (58-70 mph). Topography, presence of high-tension wires, and wind influenced altitude and speed. We made multiple passes of tall cliffs and complex terrain as necessary for a complete survey of these substrates.

For each observation, at minimum we recorded the time, a GPS waypoint using either a Garmin GPSMAP® 62s or Garmin Colorado® 400t unit, and when appropriate the occupancy status, nest size, nest condition, and nest aspect. Digital photos were taken of active nests at all new breeding areas.

Although our goal was to inventory large eagle-sized nests and not to determine occupancy or productivity, we timed the flights to correspond with the golden eagle breeding season in order to opportunistically collect such data. Without additional visits, nest survey flights were insufficient for designating sites as “unoccupied”. When we were able to determine breeding status, we followed operational definitions derived from Postupalsky (1974, 1983) and Steenhof and Kochert (1982) (Appendix A). A site was termed a current “breeding area” (BA) only if the site was documented as occupied within the last 10 years. Sites with documented occupancy more than 10 years old were termed “historic BAs”. Any areas with “large” nests and not enough observations to designate occupancy status were termed as “potential BAs”. “Large” refers to nests we deemed of suitable size for breeding golden eagles as compared to our experience with bald and golden eagle nests in Arizona. “Medium” refers to nests that were not likely to have been large enough for eagles. Golden eagle nestlings were aged following Hoechlin (1976) and Driscoll (2010).

RESULTS

The 2012 golden eagle nest survey effort totaled 127.9 hours (7,674 minutes) over 25 days (Table 1). We examined 28 current breeding areas (BAs), 28 historic BAs, and new suitable cliff nest habitat throughout Arizona, primarily in the southeast, central, east central, and north central regions of the state (Figure 1). Significant findings included 306 newly discovered large nests, 50 new BAs, 4 occupied but previously known BAs, and 4 occupied historic BAs.

By grouping the 306 new nests into suspected territories we named 171 potential BAs (Figure 2, Appendix B). At 25 of these potential BAs, we observed a single golden eagle in the area, indicating possible occupancy. In addition, there were 59 sightings of golden eagles not closely associated with nest areas.

Combining the results of our 2011 and 2012 nest surveys, we found a minimum of 516 large nests that were grouped into 328 potential BAs, and discovered 67 new BAs. In total, we have documented 109 confirmed golden eagle BAs and 57 historic BAs in Arizona, excluding those that occur on tribe lands (Figure 3).

Table 1. Areas searched and flight time used in 2012 golden eagle nest surveys (continued next page).		
Date	Areas surveyed	Time (min)
1/23	Peloncillo and Whitlock Mountains	294
1/24	Gila Mountains and Eagle Creek	420
1/25	Mt. Graham; Dos Cabezas, Dragoon, and Winchester Mountains	420
1/26	Whetstone, Rincon, Roskrige, Silver Bell, Sawtooth, and Picacho Mountains	420
1/27	Picacho, Tortolita, and Catalina Mountains	132
2/15	Cataract Canyon and Kaibab National Forest	282
2/16	Kaibab, Prescott, and Coconino National Forests; Canyon Diablo, Grapevine Canyon	318

Table 1 continued. Areas searched and flight time used in 2012 golden eagle nest surveys.		
Date	Areas surveyed	Time (min)
2/28	Seligman area (Big Boquillas Ranch, Long Point, Aubrey Cliffs, Big Chino Valley)	324
2/29	Peacock, Cottonwood, Music and Aquarius Mountains; Grand Wash Cliffs, Cross Mtn.	372
3/1	Aquarius and Mohon Mountains; Trout and Burro Creeks	342
3/2	Bagdad area (Prescott National Forest, Kirkland and Sycamore Creeks, Cottonwood Canyon), McCloud Mountains, Santa Maria River and Black Mountains	198
3/12	Show Low to Springerville, Apache-Sitgreaves National Forest, Little Colorado River, Concho, Mesa Redonda	240
3/13	Cottonwood Wash, Pink Cliffs, Black and Chevelon Canyons, Black Rock, Flying Butte	288
3/14	Clear Creek, East and West Sunset Mountains, Jacks Canyon	312
3/15	Sycamore Canyon Wilderness Area, Walnut Creek	228
3/26	Gila River and Dripping Spring Mountains, Tonto National Forest, Devils Canyon and Mineral Creek	282
3/27	Santa Teresa and Galiuro Mountains, Aravaipa Creek	408
3/28	Galiuro and Little Dragoon Mountains	390
3/29	Galiuro Mountains	270
5/15	Big Black Mesa, Juniper Mountains, Prescott National Forest, Kirkland Peak	264
5/16	Weaver, Date Creek, and Buckhorn Mountains; Granite Mountain, Prescott National Forest, Agua Fria National Monument	354
5/17	Black Hills, Fossil Creek, West Clear Creek	414
5/18	New River Mesa and Mountains; Tonto National Forest, East Verde River	240
5/19	Yuma Proving Ground (Dome Rock and Trigo Mountains)	318
5/20	Yuma Proving Ground (Trigo and Chocolate Mountains)	144

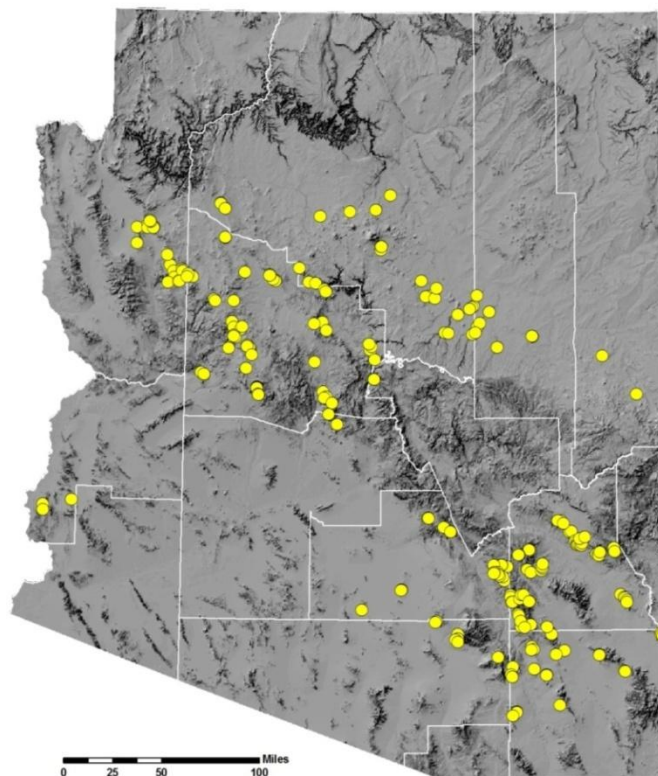


Figure 2. Distribution of new large nests found in Arizona in 2012. County lines in white.

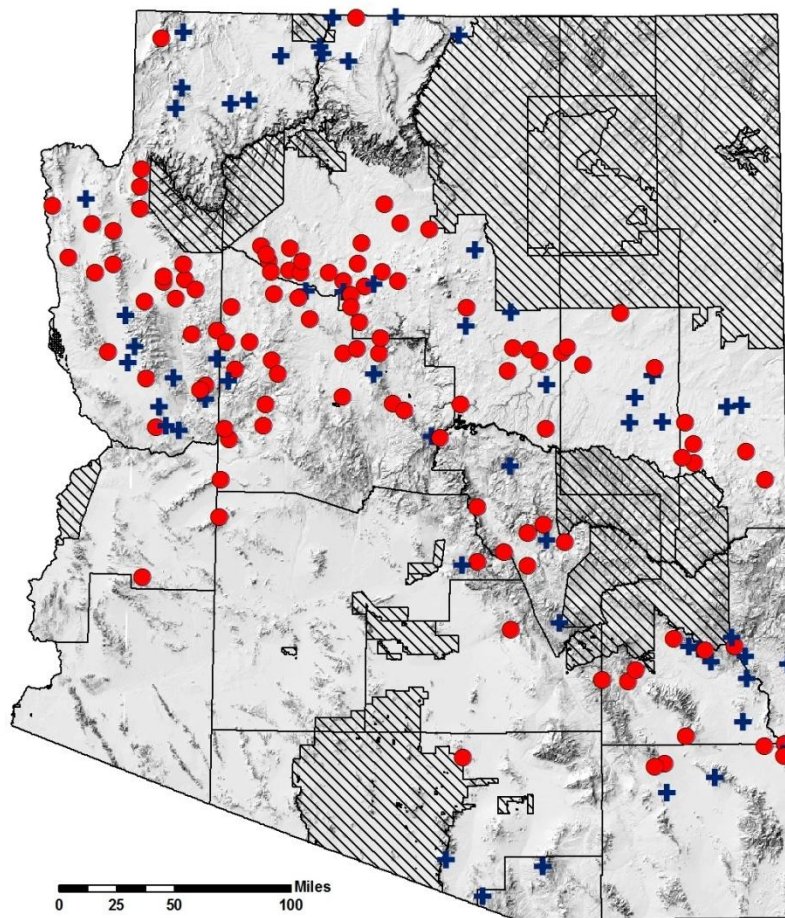


Figure 3. Distribution of current (circles) and historic (crosses) golden eagle breeding areas in Arizona as of 2012. Breeding areas are not shown on tribe lands (shaded).

Results for large nest structures and potential BAs found in 2012 are located in Appendix B. Areas worthy of further discussion (new, historic, and known BAs, and golden eagle sightings) are described here. Nest locations are sensitive data, considered confidential by AGFD, and omitted from this report. Management agencies requiring specific locations should contact the AGFD Heritage Data Management System at (623) 236-7612.

SURVEYS IN SUITABLE HABITAT

The suitable habitat surveyed in 2012 resulted in the identification of 50 new breeding areas (Table 2). Additionally, we identified 25 potential breeding areas where a single golden eagle was documented near at least one large nest. Our observations indicate these sites were possibly occupied but did not satisfy the criteria for occupancy and designation as a breeding area (Table 3).

Apache County

Mesa Redonda (new). – On March 12, 2012, we discovered a golden eagle incubating in a cliff nest (#1), and found two other large nests (#2-3) in fair to good condition. Another breeding area

discovered in 1995 was originally named Mesa Redonda, but we found the name to be inaccurate for that site because it is located almost ten miles west of Mesa Redonda. Therefore, that area was re-named The Canal (see Historic Breeding Areas).

Cochise County

Boulder Canyon (potential). – On January 25, 2012, we found a single golden eagle perched in the area of three large cliff nests in fair condition. This site is close to the Dos Cabezas historic breeding area, however we found no nests remaining there and considered it separately.

Little Dragoon Mountains 2 (potential). – On March 28, 2012, we saw three golden eagles flying within a mile of two large cliff nests, however at least two of the birds were immature and we saw no evidence of breeding activity.

Mustang Mountains (potential). – On January 26, 2012, we observed a single golden eagle perched in the area of five large cliff nests. Two of these nests were old, in poor condition. Two others were in good condition and one was noted as definitely eagle-sized.

Orange Butte (new) – On January 23, 2012, we observed a pair of golden eagles perched together in the area of a large cliff nest (#1) in fair condition.

Peloncillo Mountains (new). – On January 23, 2012, we observed a pair of golden eagles perched together in the area of three large cliff nests (#1-2) we considered definitely eagle-sized. Two of the nests were on the same level of the cliff within 25m of each other and were assigned the same nest number.

Peloncillo Mountains 2 (potential). – On January 23, 2012, we observed a single adult golden eagle flying in an area of the mountain range centered on the Arizona-New Mexico state line that had at least nine large cliff nests within a mile of the center. Nest condition and age varied considerably, however at least two nests were definitely eagle-sized and one had a lot of whitewash around it indicating it had been used frequently. We also saw two other single golden eagles 1-1.5 miles away but were unable to associate them with the group of nests. One of these other eagles appeared to be an immature, and one was unknown age.

Severin Canyon (new). – On January 25, 2012, we observed a pair of golden eagles perched together in the area of a large cliff nest (#1) we considered definitely eagle-sized. A second large nest (#2) was found tucked away on a ledge nearby.

Square Mountain (new). – On January 25, 2012, we observed three golden eagles in flight, which appeared to be a pair of adults chasing an immature away, indicating territorial behavior. We found three large nests (#1-3) in fair to good condition on the cliffs in the area.

Coconino County

Big Bud Tank (new). – On May 14, 2012, WEST, Inc. discovered a golden eagle incubating or brooding in a cliff nest (#1). On June 12, we did not see any activity at the nest and presumed it had failed.

Boquillas (new). – On February 28, 2012, we observed a pair of golden eagles perched together in the area of two large cliff nests (#1-2). On May 14, WEST, Inc. reported one nestling. We banded the 7.5-week old nestling on June 13, attached a satellite transmitter, and determined from the transmitter data that it fledged in early July.

Cataract Canyon North 2 (potential). – On February 15, 2012, we saw a single golden eagle flying in the area of two large nests in poor to fair condition, but no evidence of nesting activity.

Double Knobs (new). – On February 15, 2012, we observed a large nest (#1) in good condition on this small butte. Although the nest was empty and we saw no eagles in the area, in 2011 it was reported as having been an active golden eagle nest, and we consider it a new breeding area.

Grapevine (new). – On February 16, 2012, we observed a pair of golden eagles flying together in the area of six large cliff nests. Three of the nests were in good condition and considered definitely eagle-sized. These were on the same cliff wall and assigned as nest location #1. Two other large nests in fair condition were on a ledge in close proximity to each other (#2). The last location had one large nest (#3) in fair condition.

Grindstone Wash (new). – On February 16, 2012, we observed a pair of golden eagles perched together in the area of two large cliff nests (#1-2) in good and poor condition, respectively.

Henderson (new). – On March 15, 2012, we discovered a golden eagle incubating in a very large cliff nest (#1) (Figure 4), and found at least two other large nests on cliffs in the area (#2-3).

Johnson Canyon (new). – In 1993 and 2010, one golden eagle was observed in the area of a large nest site (#1). On February 15, 2012, we saw two eagles in the area. One of them was flying over a new large cliff nest (#2) which was in fair condition. The USFS also reported adults in the area on March 17 and June 6.

Long Point 1 (potential). – On February 28, 2012, we flushed a single golden eagle from its perch and found a large cliff nest in poor condition nearby. There was no evidence of nesting activity.

Long Point 2 (potential). – On February 28, 2012, we found a single adult golden eagle perched in the area of a large cliff nest in poor to fair condition, but saw no evidence of nesting activity.

Mesa Butte (new). – On February 15, 2012, we observed a large nest (#1) in good condition on a power line tower. Although the nest was empty and we saw no eagles in the area, in 2011 it was reported as having been an active golden eagle nest with one nestling, and we consider it a new breeding area.

Mount Floyd (new). – On February 28, 2012, we discovered a golden eagle incubating in a very large nest (#1) in a cave-like opening on the cliffs (Figure 4), and found one other large nest (#2) in the area.



Figure 4. Henderson (left) and Mount Floyd (right) breeding areas. Photos by Meggan Dugan.

Round Mountain (new). – On February 28, 2012, we observed a pair of golden eagles flying together in the area of three large cliff nests (#1-3) in good condition.

Gila County

Deadman Mesa (new). – In 2005, a large unoccupied cliff nest (#1) was discovered along Fossil Creek and suspected to be a golden eagle nest, but was not confirmed. The area was opportunistically searched in 2006 and 2010, however no activity was observed. On March 16, 2012, we found a golden eagle incubating in nest #1. The nest was empty and failed by April 25.

Hess Canyon (new). – On March 22, 2012, we found a golden eagle incubating in a cliff nest (#1) during a bald eagle nest survey. The nest was discovered in 2010 by Dale Stahlecker, who had reported a golden eagle flying to the nest with prey.

Moody Point (new). – On June 26, 2012, Department personnel observed two golden eagles at a cliff nest (#1), with one bird taking sticks to the nest. It was unknown if young were present.

Graham County

Blue Ridge (new). – On March 27, 2012, we discovered a golden eagle incubating in a large cliff nest (#1).

Bryce Mountain (new). – On January 23, 2012, we observed a pair of golden eagles flying in the area of a very large nest (#1) in very good condition. One of the eagles was strongly territorial, flying toward the helicopter with wings tucked and legs down. A second large cliff nest (#2) was also found in the area.

Garden Spring Canyon (new). – On March 27, 2012, we discovered an adult standing in a large cliff nest (#1) next to at least one egg. Two other nests were found on the cliffs within 25m of each other and were assigned the same nest number (#2).

Gila Mountains Central (new). – On January 24, 2012, we observed a pair of adults perched together in the area of two large, adjacent nests (#1). Three other large nests (#2-4) were found on cliffs in the area.

O-Bar-O (new). – On January 25, 2012, we observed a pair of adults perched together in the area of two large cliff nests (#1-2) in fair to good condition.

Santa Teresa (new). – On March 27, 2012, we discovered a golden eagle incubating in a small-looking cliff nest (#1).

Winchester Mountains 5 (potential). – On January 25, 2012, we saw a single golden eagle perched within 0.5 miles of at least two large cliff nests in good condition, the nearest one being considered definitely eagle-sized.

Yellowstone Canyon (potential). – On January 23, 2012, we saw a single golden eagle flying in the area of three large cliff nests. Two of these nests were considered definitely eagle-sized, one of them in good condition.

Mohave County

Aquarius Mountains 2 (new). – On February 29, 2012, we observed a single golden eagle in the area of two large cliff nests in the Aquarius Mountains north of Trout Creek. One nest was in good to very good condition and considered to be definitely eagle-sized.

Burro Cliffs (new). – On March 1, 2012, we discovered a golden eagle incubating in a large cliff nest (#1) (Figure 5). Three other large nests (#2-4) were found on cliffs in the area.

Cottonwood Cliffs Central (new). – On February 29, 2012, we discovered a golden eagle incubating in a large cliff nest (#1). Three other large nests (#2-4) were found on cliffs in the area, one of which we considered definitely eagle-sized.

Cottonwood Cliffs North (new). – On February 29, 2012, we discovered a golden eagle incubating in a very large cliff nest (#1) (Figure 5). A second very large nest was found nearby.



Figure 5. Burro Cliffs (left) and Cottonwood Cliffs North (right) breeding areas. Photos by Meggan Dugan.

Cross Mountain (new). – On February 29, 2012, we observed two golden eagles (one perched, one flying) in the area of two large cliff nests (#1-2).

Panther Point (new). – On March 1, 2012, we discovered a golden eagle incubating in a nest (#1) in a large cliff pothole (Figure 6). Two other large nests (#2-3) were found in the area in good to very good condition.

Peacock Peak (new). – On February 29, 2012, we discovered a golden eagle incubating in a large nest (#1) in a cliff alcove (Figure 6), and a second large nest was seen on the cliff directly above.

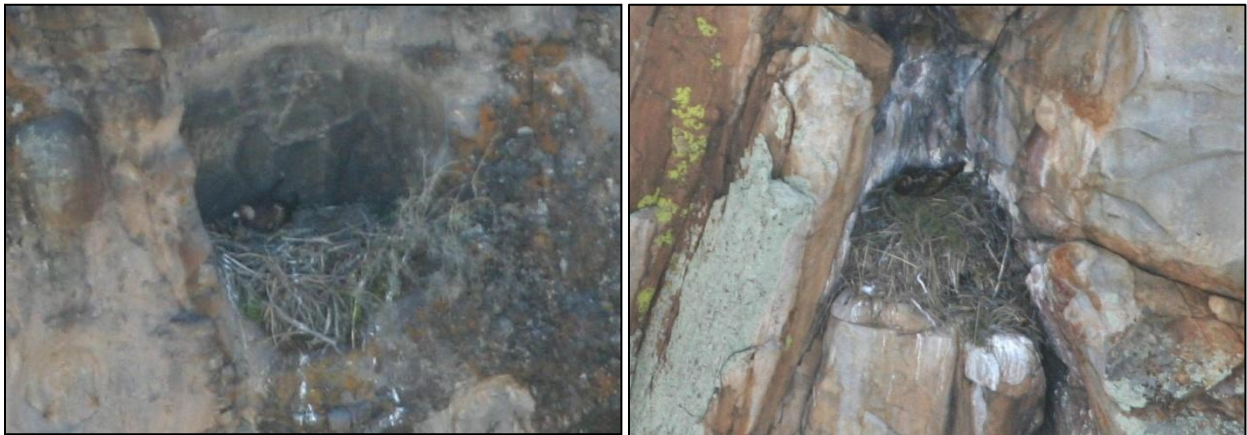


Figure 6. *Panther Point (left) and Peacock Peak (right) breeding areas. Photos by Meggan Dugan.*

Red Tanks (new). – On February 29, 2012, we observed a pair of golden eagles perched together in the area of a large cliff nest (#1).

Trap Spring (new). – On February 29, 2012, we discovered a golden eagle incubating in a large nest (#1) on the ledge of an outcrop (Figure 7).

Wright Canyon (new). – On February 29, 2012, we discovered a golden eagle incubating in a large cliff nest (#1) (Figure 7). Two other nests were found in the area. One of the nests (#2) contained some greenery, and the other (#3) was more likely a hawk nest.

Navajo County

Black Rock Spring (new). – On March 13, 2012, we discovered a golden eagle incubating in a large cliff nest (#1). Two other large nests were found close together on cliffs in the area (#2).

Chevelon Canyon 6 (potential). – On March 13, 2012, we saw a single adult golden eagle flying less than a half mile away from a large cliff nest, but saw no evidence of nesting activity.

Chevelon-Rock Creek (new). – On March 13, 2012, we discovered a golden eagle incubating in a large cliff nest (#1), and found a second large nest (#2) on cliffs in the area.

Clear Creek (new). – On March 14, 2012, we discovered a golden eagle incubating in a small-looking cliff nest (#1) tucked well back on a ledge.



Figure 7. Trap Spring (left) and Wright Canyon (right) breeding areas. Photos by Meggan Dugan.

Corbet Tank (new). – On March 14, 2012, we discovered a golden eagle incubating in a small-looking cliff nest (#1).

Pima County

Ragged Top (potential). – On January 26, 2012, we saw a single golden eagle perched in the area of four large cliff nests, three of which were in good condition. At least one nest was considered to be definitely eagle-sized.

Waterman Mountains (new). – On January 26, 2012, we observed a pair of golden eagles perched together in the area of a large cliff nest (#1), and found two other nests (#2-3) on cliffs nearby.

Pinal County

Rincon (new). – On March 26, 2012, we discovered a golden eagle incubating in a small-looking cliff nest (#1).

Yavapai County

Big Chino (new). – On May 14, 2012, WEST, Inc. observed a golden eagle incubating or brooding in a cliff nest (#1). We had found two other large nests (#2-3) in the area on February 28 but did not see nesting activity at that time.

Big Chino Valley 1 (potential). – On February 28, 2012, we observed a single golden eagle performing an undulating flight display indicative of territoriality in the area of three large cliff nests, one of which was in good condition.

Camp Wood (new). – On May 15, we observed a pair of golden eagles (one perched and one flying) in the area of a very large cliff nest (#1).

Cherry Creek (new). – On May 17, 2012, we discovered a large cliff nest (#1) with a five-week old golden eagle nestling in it (Figure 8). We also found a second large nest (#2) in the area.

Copper Creek (new). – On May 17, 2012, we discovered a large cliff nest (#1) with two golden eagles standing on it (Figure 8). At least one was an adult, and the second one was probably a nestling near fledging age but we were unable to confirm it as such due to windy flight conditions.



Figure 8. *Cherry Creek (left) and Copper Creek (right) breeding areas. Photos by Ryan Babel.*

McCloud Mountains (new). – On March 2, 2012, we discovered a golden eagle incubating in a large cliff nest (#1). One other large nest (#2) was found on the cliffs in the area.

Mohon Mountains (new). – On March 1, 2012, we discovered a golden eagle incubating in a large nest (#1) in a cliff pothole (Figure 9). Two other large nests (#2-3) were found on the cliffs in the area.

Mount Hope (new). – On March 1, 2012, we observed two adult golden eagles perched near at least two large cliff nests (#1-2) in good to very good condition. A third eagle was seen flying about a mile to the southeast of the peak.

Picacho Butte (new). – On February 28, 2012, we discovered a golden eagle incubating in a large cliff nest (#1) which had been dusted with snow during a storm the day before (Figure 9).



Figure 9. *Mohon Mountains (left) and Picacho Butte (right) breeding areas. Photos by Meggan Dugan.*

Pine Spring (new). – On May 15, 2012, we observed two adult golden eagles soaring over a large cliff nest (#1).

South Butte (new). – On February 28, 2012, we observed two golden eagles in the area of three large nests, one of which was in good condition (#1) and two in poor condition (#2-3).

Sycamore (new). – On March 2, 2012, we observed two territorial golden eagles flying in the area of three large nests (#1-3), two of which were in good condition.

Table 2. Summary of new breeding areas in 2012 (continued next page).				
Breeding Area	Status ¹	Elevation (feet)	Nests in area	Comments
Apache County				
Mesa Redonda	A	6510	3	Adult incubating in nest #1 on 3/12.
Cochise County				
Orange Butte	O	5066	1	Pair of adults perched together on 1/23.
Peloncillo Mountains	O	5109	3	Pair of adults perched together on 1/23.
Severin Canyon	O	6126	2	Pair of adults perched together on 1/25.
Square Mountain	O	5460	3	Two adult and one immature golden eagles in area on 1/25.
Coconino County				
Big Bud Tank	F	6253	1	Adult incubating/brooding in nest #1 on 5/14. Nest empty on 6/12.
Boquillas	S	6017	2	Pair of adults perched in area on 2/28. One 9.5-week old nestling on 6/28.
Double Knobs	–	6621	1	Large nest present (reported as active in 2011).
Grapevine	O	5925	6	Pair of adults flying together on 2/16.
Grindstone Wash	O	6309	2	Pair of adults perched together on 2/16.
Henderson	A	5601	3	Adult incubating in nest #1 on 3/15.
Johnson Canyon	O	6315	2	Two golden eagles in area on 2/15, 3/17, 6/6. New nest #2 found.
Mesa Butte	–	6555	1	Large nest present (reported as active in 2011).
Mount Floyd	A	7215	2	Adult incubating in nest #1 on 2/28.
Round Mountain	O	6647	3	Pair of adults flying together on 2/28.
Gila County				
Deadman Mesa	F	3550	1	Adult incubating in nest #1 on 3/16. Nest empty on 4/25.
Hess Canyon	A	3429	1	Adult incubating in nest #1 on 3/22.
Moody Point	O	4987	1	Two golden eagles observed at nest #1 on 6/26.
Graham County				
Blue Ridge	A	5355	1	Adult incubating in nest #1 on 3/27.
Bryce Mountain	O	7159	2	Pair of adults flying, territorial on 1/24.
Garden Spring Canyon	A	4153	3	Adult in nest #1 with one egg on 3/27.
Gila Mountains Central	O	5276	5	Pair of adults perched together on 1/24.
O-Bar-O	O	5663	2	Pair of adults perched together on 1/25.
Santa Teresa	A	6152	1	Adult incubating in nest #1 on 3/27.
Mohave County				
Burro Cliffs	A	4000	4	Adult incubating in nest #1 on 3/1.
Cottonwood Cliffs Central	A	5893	4	Adult incubating in nest #1 on 2/29.

¹ Breeding area status codes: U=unoccupied, O=occupied, A=active, S=successful, F=failed.

Table 2 continued. Summary of new breeding areas in 2012.				
Breeding Area	Status ¹	Elevation (feet)	Nests in area	Comments
Cottonwood Cliffs North	A	5338	1	Adult incubating in nest #1 on 2/29.
Cross Mountain	O	6421	2	Pair of adults in area on 2/29.
Panther Point	A	4862	3	Adult incubating in nest #1 on 3/1.
Peacock Peak	A	6263	2	Adult incubating in nest #1 on 2/29.
Red Tanks	O	4426	1	Pair of adults perched together on 2/29.
Trap Spring	A	5506	1	Adult incubating in nest #1 on 2/29.
Wright Canyon	A	4390	3	Adult incubating in nest #1 on 2/29.
Navajo County				
Black Rock Spring	A	5935	3	Adult incubating in nest #1 on 3/13.
Chevelon-Rock Creek	A	5538	2	Adult incubating in nest #1 on 3/13.
Clear Creek	A	5223	1	Adult incubating in nest #1 on 3/14.
Corbet Tank	A	5335	1	Adult incubating in nest #1 on 3/14.
Pima County				
Waterman Mountains	O	3432	3	Pair of adults perched together on 1/26.
Pinal County				
Rincon	A	3527	4	Adult incubating in nest #1 on 3/26.
Yavapai County				
Big Chino	A	5775	3	Adult incubating/brooding in nest #1 on 5/14.
Camp Wood	O	7110	1	Pair of adults in area on 5/15.
Cherry Creek	A	5233	2	One 5-week old nestling golden eagle in nest #1 on 5/17.
Copper Creek	O	4885	1	Pair of golden eagles standing in nest #1 on 5/17.
McCloud Mountains	A	4551	2	Adult incubating in nest #1 on 3/2.
Mohon Mountains	A	6989	3	Adult incubating in nest #1 on 3/1.
Mount Hope	O	6985	2	Pair of adults perched together on 3/1.
Picacho Butte	A	6966	1	Adult incubating in nest #1 on 2/28.
Pine Spring	O	5804	1	Pair of adults flying together on 5/15.
South Butte	O	5617	3	Pair of adults perched together on 2/28.
Sycamore	O	3261	4	Pair of adults flying, territorial on 3/2.

¹ Breeding area status codes: U=unoccupied, O=occupied, A=active, S=successful, F=failed.

Table 3. Summary of golden eagle sightings near large nests in 2012 (continued next page).			
Location	Date	Nests in Area	Comments
Cochise County			
Boulder Canyon	1/25	3	One golden eagle perched.
Little Dagoon Mountains 2	3/28	2	Three golden eagles flying (at least two immature).
Mustang Mountains	1/26	5	One golden eagle perched.
Peloncillo Mountains 2	1/23	9+	One adult flying in area. Two other single golden eagles of unknown age 1-1.5 miles away.
Coconino County			
Cataract Canyon North 1	2/15	≥2	One immature flying.
Cataract Canyon North 2	2/15	2	One golden eagle flying.
Jacks Canyon 1	3/14	1	One golden eagle soaring.
Long Point 1	2/28	1	One golden eagle flushed from perch.
Long Point 2	2/28	1	One golden eagle in area. Nest poor to fair.
Coconino/Gila County			
Sandrock Canyon	5/17	1	One golden eagle flew off cliff then perched again.

Table 3 continued. Summary of golden eagle sightings near large nests in 2012.			
Location	Date	Nests in Area	Comments
Gila County			
Hieroglyphic Canyon	5/18	1	One golden eagle flushed off cliff.
Graham County			
Winchester Mountains 5	1/25	≥2	Adult perched on peak.
Yellowstone Canyon	1/23	3	One golden eagle flying in area.
La Paz County			
Chocolate Mountains	5/20	3	One golden eagle flying, perched. Nests poor to fair.
Mohave County			
Aquarius Mountains 2	2/29	2	One golden eagle in area.
Cherokee Point	2/29	2	One golden eagle in area. Nests fair to good.
Grand Wash 5	2/29	2	Adult perched. Nests good.
Grand Wash 6	2/29	≥3	One golden eagle flying.
Navajo County			
Chevelon Canyon 6	3/13	1	One adult flying.
Pima County			
Ragged Top	1/26	4	One golden eagle perched.
Pinal County			
Aravaipa Canyon 3	3/27	4	One golden eagle flushed from cliff top.
Yavapai County			
Big Chino Valley 1	2/28	3	One golden eagle flying.
Burro Creek 2	3/1	1	One golden eagle soaring. Nest good.
Pilot Knob	3/1	2	One golden eagle perched. One nest good, one poor.
Sullivan Buttes	5/15	2	Adult flying over area.

HISTORIC BREEDING AREAS

We surveyed 28 historic breeding areas (BAs) located within the 2012 nest survey area and confirmed occupancy at four sites. At two other historic BAs, a single golden eagle was seen near a large nest, and at one other BA an eagle was seen but no nest was found. At the remaining 21 historic BAs, we found nests without eagles at 13 sites and 8 sites where neither eagles nor nests were detected (Table 4). Specific historic data and 2012 survey results for each of these areas are detailed below. Any historic BA documented as being occupied during the 2012 nest survey will be reclassified as a current BA in future reports.

Apache County

180 Powerline. – In 1997 and 1998 the territory was deemed active with a nest on a power pole, but no other information was provided. In 2006, no nest was found during one visit. On March 12, 2012, we also did not find a nest on any of the power line tower structures in the area, which was the only substrate type available.

Heaps Tree. – In 1997, a tree nest (#1) was reported and the territory was deemed active, but no additional information on the status of the site was provided. In 2006, nest #1 was reported fallen. On March 12, 2012, we found a new large nest (#2) in a cottonwood snag 0.3 miles north of the original location.

LCR Lyman Lake. – In 1994, two adult golden eagles were seen in the area of four cliff nests, although only one set of coordinates was reported. On March 12, 2012, we found a large nest (#1) present in the original location in the canyon and three other large nests (#2-4) on the opposite cliff, with an adult incubating in nest #2. This area will be removed from the list of historic sites and considered a current breeding area.

Cochise County

Dos Cabezas Mountains. – In 1979, a nestling was seen on April 12, and fledgling on June 15. In 2006, no nests or eagles were seen during one visit. On January 25, 2012, we also did not find any nests or eagles.

Old Horseshoe Canyon. – In 1979 and 1980, two fledglings and one fledgling were observed, respectively. In 2006, no nests or eagles were seen during one visit. On January 23, 2012, we did not find any nests in the original location. However, we found nine large cliff nests and three golden eagles across an area of the Peloncillo Mountains near the state line with New Mexico, approximately two miles south of this historic BA (see *Peloncillo Mountains 2* in Surveys in Suitable Habitat above).

Red Bird Hills. – In 1979, two adult golden eagles and one nestling and/or fledgling was observed. In 2006, no nests or eagles were seen during one visit. On January 25, 2012, we found a nest structure present in the original location, however it appeared to be a smaller hawk nest that had been built upon the remnants of the old eagle nest platform.

Coconino County

Chevelon Butte. – In 1996, the territory was deemed active but no additional information on the status of the site was provided. In 2006, nest #1 was reported as partially fallen. On March 13, 2012, we did not find nest #1 however there was one adult golden eagle perched in the area.

East Sunset Mountain. – In 2000, the territory was deemed active (nest #1) but no additional information on the status of the site was provided. In 2006, up to seven nests were observed but only two new nest locations (#2, 3) were noted. On March 14, 2012, we found a golden eagle incubating in a large cliff nest (#4) in a vertical crack in the cliff face. Due to the height of the structure it must have been built upon for many years before 2012 and was likely observed in prior surveys, however none of the previously reported coordinates accurately matched its location. Upon finding the active nest, we left the area and did not search for any of the alternate nests. This area will be removed from the list of historic sites and considered a current breeding area.

Prairie Dog Tank. – In 1973 and 1978, one fledgling was reported. Contradictory information in 1979 indicates both one fledged and also “success unknown”. In 1982, activity was seen at an alternate nest, and in 1983 a nestling was reported. In 2006, no nests or eagles were seen during one visit. On February 15, 2012, we also found no nests or eagles. The original nest substrate was listed as a Ponderosa pine (*Pinus ponderosa*) tree on top of a cinder cone and the nest(s) may have fallen some time ago.

Steiger Tank. – In 1982, one fledgling was reported and in 1983 two nestlings were seen. In 2010, the U.S. Forest Service reported that the nest was not intact. On February 15, 2012, we found a large nest in fair condition in the historic location, and a medium nest in poor condition in the area.

Upper Lake Mary. – We have locations for two tree nests that were active or occupied in the mid-1980s (Eakle and Grubb 1986, Grubb and Eakle 1987), but no further occupancy or productivity data. On February 16, 2012, we did not find any nests or eagles in the area.

West Sunset Mountain. – In 1999, the territory was deemed active (nest #1) but no additional information on the status of the site was provided. In 2000 and 2006, no activity was observed. On March 14, 2012, we found a golden eagle incubating two eggs at a new cliff nest (#2), and found three other new large nests (#3-5) in the area. This area will be removed from the list of historic sites and considered a current breeding area.

Graham County

Big Spring Canyon. – In 1979, two adults were reported at nest #1 on May 17. In 2006, no nests or eagles were found during one visit. On January 24, 2012 we found nest #1 had degraded into very poor condition with no structure, indicating it had not been used for many years. We also found three new large cliff nests (#2-4) in poor to fair condition.

Gila Peak. – In 1979, one nestling was reported in nest #1 on May 18. On January 24, 2012 we did not find nest #1 but discovered at least ten new large cliff nests at six sites (#2-7). At two of the new numbered locations, three or more large nests were present in close proximity. Nest condition ranged from poor to good. Six of the nests were considered definitely eagle-sized.

Javelina Peak. – In 1979, an adult and immature golden eagle were reported on April 17, as well as a nest (#1). In 2006, no nests or eagles were found during one visit. On January 23, 2012, we did not find nest #1 but discovered a new cliff nest (#2) in poor condition about 0.4 miles from the historic location. Also, a pair of adult golden eagles was observed flying and perched together two miles north of nest #2, which we considered too far away to positively associate with the historic breeding area.

Markham Creek. – In 1980, one 6-7-week old nestling was reported in nest #1 on May 15. On January 24, 2012, we did not find nest #1 but discovered new large cliff nests #2-7, definitely eagle-sized, in fair to good condition.

Tollgate Canyon. – In 1979, two fledglings were reported at a cliff nest, however the data form listed three nesting stages with one observation date of April 20. On January 23, 2012, we did not find any nests or eagles in the area.

Weber Peak. – In 1979, one nestling was reported in nest #1 on May 17. In 2006, no nests or eagles were found during one visit. On January 24, 2012, we did not find nest #1 but discovered new large cliff nests #2-4 in fair to good condition within 1.2 miles of the historic location.

Greenlee County

Bear Canyon. – In 1979 and 1980, one fledgling was reported in both years. On January 24, 2012, we did not find nest #1 but discovered three new large cliff nests (#2-4), all definitely eagle-sized, within 0.6 miles of the historic location.

Hot Springs Canyon. – In 1979, one fledgling was reported, however the data form listed two nesting stages with one observation date of May 17. On January 24, 2012, we did not find nest #1 but discovered a large cliff nest (#2) in good condition within a mile. A pair of golden eagles was seen flying (including undulating flight) and perched together in the area of the new nest. This area will be removed from the list of historic sites and considered a current breeding area.

Mohave County

Francis Creek. – In 1979, two six-week old nestlings were reported on June 13. In 2006, no nests were found during two visits. On March 1, 2012, no nest was found at the nest #1 coordinates, which appeared to be inaccurate. We found two cliff nests in the area, one of which was in fair to good condition (#2). The other nest was old and seemed to match the description of nest #1, however this was not confirmed and we considered it a separate nest (#3).

Navajo County

Cottonwood Wash. – In 2000, the territory was deemed active but no additional information on the status of the site was provided. In 2006, a second nest (#2) was found nearby. On March 13, 2012, we found a new large cliff nest (#3) in fair to good condition in the area. Nest #1 was present, however #2 was not seen.

Pink Cliff. – In 1998 and 1999, the territory was deemed active but no additional information on the status of the site was provided. On March 13, 2012, we found an old nest structure in the original location but not much of it remained.

The Canal. – In 1995, incubation was reported on March 30. In 1997, the territory was reported as active. On March 12, 2012, we found a new large cliff nest (#2) in very good condition, and one adult golden eagle flushed from the ground nearby. This breeding area was originally named Mesa Redonda when discovered in 1995, but we found the name to be inaccurate because it is located almost ten miles west of Mesa Redonda. Also, in 2012 we discovered a new breeding area on Mesa Redonda and have used the name to describe it instead.

Woodruff Ditch. – In 1998, the territory was deemed active but no additional information on the status of the site was provided. In 2006, no nests or eagles were seen during one visit. On March 13, 2012, we did not find a nest at the original location but discovered at least four new large nests, two of them in good condition. All of the nests were in close proximity to each other and assigned the same nest location (#2).

Yavapai County

Crookton. – In 1998, a nestling and adult golden eagle were observed on May 27. On February 28, 2012, we found a small nest on marginal substrate in the area of the historic location.

Woodchute Mountain. – In 2000, two adults and one nestling were reported at nest #1. In 2006, no activity was observed but one adult golden eagle was in the area. On May 17, 2012, we found new large cliff nests #2-3 and one adult golden eagle in the area.

Table 4. Summary of findings at historic breeding areas surveyed in 2012 (continued next page).				
Breeding Area	Status ¹	Dates surveyed	Nests in Area	Comments
Apache County				
180 Powerline	–	3/12	0	Nest not found. No new nests or eagles.
Heaps Tree	–	3/12	1	New tree nest #2 found. No eagles.
LCR Lyman Lake	A	3/12	4	Golden eagle incubating in nest #2.
Cochise County				
Dos Cabezas Mountains	–	1/25	0	Nest #1 not found. No eagles.
Old Horseshoe Canyon	–	1/23	0	Nest #1 not found. No eagles.
Red Bird Hills	–	1/25	1	Nest structure present. No eagles.
Coconino County				
Canyon Diablo	–	2/16	1	All known nests empty. No eagles.
Chevelon Butte	–	3/13	0	Nest #1 not found. One golden eagle in area.
East Sunset Mountain	A	3/14	1+	Golden eagle incubating in new cliff nest #4.
Prairie Dog Tank	–	2/15	0	Nest #1 not found. No eagles.
Steiger Tank	–	2/15	1	New nest #2 found. All known nests empty. No eagles.
Upper Lake Mary	–	2/16	0	Nest #1, 2 not found, fallen. No eagles.
West Sunset Mountain	A	3/14	5	Golden eagle incubating in new cliff nest (#2). New large cliff nests #3-5 found.
Graham County				
Big Spring Canyon	–	1/24	4	Nest #1 found. New cliff nests #2-4 found. No eagles.
Gila Peak	–	1/24	6+	Nest #1 not found. New cliff nests #2-7 found. No eagles.
Javelina Peak	–	1/23	1	Nest #1 not found. New cliff nest #2 found. No eagles.
Markham Creek	–	1/24	6+	Nest #1 not found. New cliff nests #2-7 found. No eagles.
Tollgate Canyon	–	1/23	0	Nest #1 not found. No eagles.
Weber Peak	–	1/24	3	Nest #1 not found. New cliff nests #2-4 found. No eagles.
Greenlee County				
Bear Canyon	–	1/24	3	Nest #1 not found. New cliff nests #2-4 found. No eagles.
Hot Springs Canyon	O	1/24	1	Nest #1 not found. New cliff nest #2 found. Two golden eagles in area.
Mohave County				
Francis Creek	–	3/1	2	Nest #1 not found. New cliff nests #2, 3 found. No eagles.
Navajo County				
The Canal	–	3/12	1	Nest #1 not found. New cliff nest #2 found. One golden eagle in area.
Cottonwood Wash	–	3/13	2	Nest #1 present, #2 not found. New cliff nest #3 found. No eagles.
Pink Cliff	–	3/13	1	Nest #1 present in poor condition. No eagles.
Woodruff Ditch	–	3/13	4+	Nest #1 not found. At least 4 new large nests found in area. No eagles.

¹ Breeding area status codes: O=occupied, A=active, –=undetermined.

Table 4 continued. Summary of findings at historic breeding areas surveyed in 2012.				
Breeding Area	Status ¹	Dates surveyed	Nests in Area	Comments
Yavapai County				
Crookton	–	2/28	1	Nest #1 not found. Small nest in area on marginal substrate. No eagles.
Woodchute Mountain	–	5/17	3	Nest #1 present. New cliff nests #2-3 found. One golden eagle in area.

¹ Breeding area status codes: – =undetermined.

KNOWN BREEDING AREAS

These areas have had documented golden eagle occupancy in at least one of the past ten years, and were discovered prior to this year's survey (Table 5). Significant findings in 2012 are detailed below.

Apache County

Dutch Mountain. – The breeding area was reported as active in 2004-2005, and failed in 2006. On March 12, 2012, we found nest #1 and a new large nest (#2) on a ledge within 50 meters. No eagles were seen, but the nests were in very good condition and were decorated with greenery.

Nutrioso Creek. – The breeding area was reported as active in 2004-2005, but no other information on the status of the site was provided. In 2006, no nests or eagles were seen during one visit. On March 12, 2012, we saw some scattered sticks on a ledge in the general location of where nest #1 should have been, but not enough material was present to even confirm this as a nest. No other nests were found.

Coconino County

Aubrey Cliffs 2. – The breeding area was occupied in 2008, when two adult golden eagles and two cliff nests were reported. On February 28, 2012, we observed incubation in nest #1 and identified five other nests in three locations (#2-4).

Aubrey Cliffs 3. – The breeding area was occupied in 2008, when a pair of adult golden eagles displaying courtship behavior were observed near at least two cliff nests. On February 28, 2012, we saw two adults perched together and identified four large nests (#1-4), two of which were in good condition.

Aubrey Cliffs 4. – The breeding area was active in 2008, and incubation was noted on March 7 that year. On February 28, 2012, we found three large cliff nests in the same location (#1) and saw one golden eagle flying in the area.

Aubrey Cliffs 5. – The breeding area was reported as occupied in 2008. On February 28, 2012, we observed one golden eagle in the area of two large cliff nests, which were almost side by side on the cliff at the same level (#1).

Cedar Mountain. – On February 15, 2012, we did not find any nests or eagles. The USFS reported one adult in the area on May 2 but no nesting activity was observed.

Chavez Pass. – On March 14, 2012, we did not find nest #1 at the given coordinate, which appeared to be inaccurate. No nests were found on the cliffs or trees in the area.

Flat Mesa. – On February 16, 2012, we found a new large cliff nest (#2) in fair to good condition. We also saw a single golden eagle approximately 1.5 miles away that may have belonged with the breeding area, but we considered it separate. On May 2, the USFS reported one adult in the area but no nesting activity was observed.

Red Butte. – In 1979, a fledgling was observed on July 23. In 2006, the site was considered occupied, although a nest was not found. On February 15, 2012, we found a nest in the original location and two adult golden eagles perched nearby. The USFS later reported two nestlings, one of which died in the nest, and in July saw an adult with a juvenile feeding on a elk carcass about 8 miles away, closer to Red Butte than any other known breeding area.

Mohave County

Trout Creek. – On March 1, 2012, a golden eagle was incubating in nest #1.

Yavapai County

Granite. – We surveyed the area on four occasions during bald eagle nest searches, and found a new cliff nest (#5) in the area. On January 9 and March 16 we saw one adult golden eagle perched near nest #2, which was in good condition.

Hell Point. – We surveyed the area on four occasions during bald eagle nest searches, and observed a golden eagle incubating in nest #3 on March 16. The eagle was either incubating or possibly brooding a nestling on April 25.

Watson Lake. – We examined nests #1 and 2 on three occasions during bald eagle nest searches, and on April 25 saw one adult golden eagle perched in the area of nest #1, which was in good condition. Nest #2 was in poor condition.

Table 5. Summary of findings at known breeding areas surveyed in 2012 (continued next page).				
Breeding Area	Status ¹	Dates surveyed	Nests in Area	Comments
Apache County				
Dutch Mountain	O	3/12	2	Two nests found in very good condition; one nest with greenery. No eagles.
Nutriosio Creek	–	3/12	0	Nest #1 not found. No eagles.
Wolf Mountain	–	3/12	1	All known nests empty and no eagles.
Ziegler Mountain	–	3/12	1	All known nests empty and no eagles.
Cochise County				
Engine Mountain	–	1/23	2	All known nests empty and no eagles.
Coconino County				
Aubrey Cliffs 2	A	2/28	6	Adult golden eagle incubating in nest #1 on 2/28.

¹Breeding area status codes: O=occupied, A=active, – =undetermined .

Table 5 continued. Summary of findings at known breeding areas surveyed in 2012.				
Breeding Area	Status ¹	Dates surveyed	Nests in Area	Comments
Aubrey Cliffs 3	O	2/28	4	Two golden eagles perched together on 2/28.
Aubrey Cliffs 4	–	2/28	3	One golden eagle in area on 2/28.
Aubrey Cliffs 5	–	2/28	2	One golden eagle in area on 2/28.
Cataract Canyon	–	2/15	1	All known nests empty and no eagles.
Cedar Mountain	–	2/15	1	All known nests empty. USFS reported one adult in area on 5/2.
Chavez Pass	–	3/14	0	Nest #1 not found. No eagles.
Double A Knoll	–	2/15	1	All known nests empty and no eagles.
Eagle Nest Mountain	–	2/15	2	All known nests empty and no eagles.
Flat Mesa	–	2/16	2	New cliff nest #2 found. All known nests empty and no eagles.
Muleshoe	–	2/15	0	Nest #1 not found. No eagles.
Perrin Ranch	–	2/15	1	All known nests empty and no eagles.
Red Butte	S	2/15	1	Two adult golden eagles perched near nest #1 on 2/15.
Walnut Canyon	–	3/15	1	All known nests empty and no eagles.
West Clear Creek	–	5/17	0	Nest #1 not found. No eagles.
Gila County				
Pinto Creek	–	3/6	1	All known nests empty and no eagles.
Mohave County				
Trout Creek	A	3/1	1	Adult golden eagle incubating in nest #1 on 3/1.
Navajo County				
Woodruff Butte	–	3/13	0	No nests or eagles found.
Yavapai County				
Burro Mesa	–	3/16	1	All known nests empty and no eagles.
Granite	U	1/9, 1/30, 3/16, 4/25	5	One adult golden eagle perched in the area on 1/9 and 3/16. New cliff nest #5 found. All known nests empty.
Hell Point	A	1/9, 1/30, 3/16, 4/25	4	Adult golden eagle incubating in nest #3 on 3/16 . Adult incubating or brooding on 4/25.
Mormon Pocket	U	1/9, 1/30, 3/16, 4/25	2	All known nests empty and no eagles.
Watson Lake	U	1/30, 3/16, 4/25	2	One adult golden eagle perched in area on 4/25. All known nests empty.

¹Breeding area status codes: U=unoccupied, O=occupied, A=active, S=successful, – =undetermined .

ADDITIONAL GOLDEN EAGLE SIGHTINGS

During the 2012 nest survey, we documented 59 sightings of golden eagles that were not associated with a nest area (Table 6). Additional details for the most significant sightings are included below.

Coconino County

Aubrey Cliffs. – On February 28, 2012, we observed an immature golden eagle flying above the Aubrey Cliffs 0.6 miles north of Crater Canyon. A second and third eagle, possibly an adult pair, were seen along the cliffs 1.8 and 2.5 miles south of Crater Canyon. No nests were found in the immediate area of any of these birds.

Buck Mountain. – On February 15, 2012, we saw two golden eagles perched on trees on this cinder cone. Although we did not find any nests in the area, the tall pines on the peak and slopes could provide for a nest.

Clear Creek, south. – On March 14, 2012, we saw two golden eagles near the Willow Creek confluence with Clear Creek, south of Hamilton Crossing. One eagle was soaring high and the other was low in the canyon. There were at least two large, old cliff nests in the area, neither of which we considered to be in sufficiently useable condition to associate with the pair.

Ferguson Tank. – On February 28, 2012, we saw a pair of adult golden eagles perched on the cliffs west of Ferguson Tank, but found no nests in the area.

Sawtooth Mesa. – On February 16, 2012, we observed a golden eagle perched on Sawtooth Mesa but found no nests. It is likely this eagle was associated with the Flat Mesa breeding area 1.5 miles away, however no evidence of breeding activity was noted there.

Trinity Mountain. – On February 28, 2012, we saw a pair of golden eagles flying around Trinity Mountain. There was also a pair of eagles flying near the unnamed peak northeast of Trinity Mountain and one of these birds executed an undulating flight display indicative of territoriality. A chance exists that the sightings were of the same pair. No nests were found, but we suspect at least one nest was likely present and went undetected. An immature golden eagle was also seen flying less than a mile away from the second sighting of a pair.

Cochise County

Mount Rayburne. – On January 23, 2012, we saw a pair of adult golden eagles perched together on posts along a fence line atop this small summit. We examined the area but found no cliffs or other potential nesting substrate within several miles.

Winchester Mountains. – On January 25, 2012, we flushed a pair of golden eagles from their perch on a rock outcrop in the Winchester Mountains. Although we found a nest within a mile, we did not consider it to be of sufficiently useable condition or size to associate with the pair.

Graham County

Black Hills. – On January 23, 2012, we observed a pair of adult golden eagles perched together on the cliffs south of Highway 191, but found no nests in the area.

Whitlock Mountains. – On January 23, 2012, we observed a pair of golden eagles soaring and perching together in the Whitlock Mountains north of Javelina Peak. We found a nest on the cliffs nearby, but did not consider it to be of sufficiently useable condition or size to associate with the pair. We also did not find any nests at the Javelina Peak historic breeding area.

Mohave County

McGee Wash. – On February 29, 2012, we observed a pair of golden eagles perched in the McGee Wash area of Trout Creek. We found a nest on cliffs within a mile, but did not consider it to be of sufficiently useable condition or size to associate with the pair.

Trout Creek. – On March 1, 2012, we saw two golden eagles soaring above the cliffs west of Panther Point. At least one of these birds very likely belonged with the Panther Point breeding area, which we discovered later, but the association was not clear. We also saw an immature golden eagle flying near the Point at a separate time.

Navajo County

Clear Creek, north. – On March 14, 2012, approximately three miles north of Relic Point on Clear Creek, we observed a pair of golden eagles flying low in the canyon. We suspected nesting activity but were unable to locate any nests within two miles.

Yavapai County

Black Mountains. – On March 2, 2012, we saw a golden eagle flying in the area south of Ives Peak. There were several nests on the cliffs within this small range, but we were uncertain if the eagle was associated with them or the nearby Poachie breeding area. Also, high winds prevented us from effectively searching portions of the range, including the southernmost peaks (Tres Alamos).

Hutch Mesa. – On May 18, 2012, we observed two golden eagles in the area, one perched and one flying, but did not find a nest. However we were unable to search more thoroughly due to fuel constraints. AGFD and USFS personnel incidentally observed a pair of golden eagles in this same location in October and December 2011, so this area is worthy of further examination.

Turret Peak. – On May 18, 2012, we observed a pair of golden eagles perched together on this peak but did not find a nest there. However we were unable to search all available substrate in the area due to fuel constraints.

Table 6. Summary of additional golden eagle sightings in 2012 (continued next page).			
Location	Date	Number of Eagles	Comments
Coconino County			
Aubrey Cliffs, Crater Canyon	2/28	3	One immature flying. Two other golden eagles in area.
Buck Mountain	2/15	2	Pair of adults perched.
Cataract Canyon	2/15	2	One immature near Miller Wash and one adult or subadult near Spring Valley Wash.
Chino Point	2/28	1	Immature flying.
Clear Creek, south	3/14	2	Two golden eagles in area of Willow Creek confluence.
Clear Creek, north	3/14	2	Two golden eagles in canyon north of Relic Point.
East Sunset Mountain	3/14	1	Immature flushed from cliff rim.
Ferguson Tank	2/28	2	Two adults perched.
Long Point Well	2/28	1	One golden eagle perched on point east of Long Point Well.
Merrill Crater	2/16	2	Two immatures flying.
Pine Creek Wash	2/15	1	Adult flying.
Sawtooth Mesa	2/16	1	One golden eagle perched.
Three Sisters	2/15	1	Adult perched on outcrop.
Trinity Mountain	2/28	5	Two golden eagles flying together. Second pair and one immature in the area.
Walnut Canyon	3/15	1	One golden eagle flying two miles away from Walnut Canyon breeding area.

Table 6 continued. Summary of additional golden eagle sightings in 2012.			
Location	Date	Number of Eagles	Comments
Allen Flat	3/28	1	Immature soaring.
Cochise County			
Dos Cabezas Mountains	1/25	1	One golden eagle flying.
Mount Rayburne	1/23	2	Pair of adults perched together on adjacent fence posts. No nesting substrate available in area.
Winchester Mountains	1/25	2	Pair of adults perched together, flushed.
Graham County			
Black Hills	1/23	2	Pair of adults perched together.
Kane Spring Mountain	1/25	1	Perched on peak. Good habitat but poor nesting substrate.
Santa Teresa Mountains	3/27	3	Two immatures and one adult soaring low. Adult likely associated with the Santa Teresa breeding area.
Whitlock Mountains	1/23	2	Pair of adults soaring and perching.
Mohave County			
Aquarius Mountains	3/1	1	Immature flying in area of Lower Parsons Well.
Cottonwood Cliffs	2/29	1	One golden eagle flying south of Valentine.
McGee Wash	2/29	2	Pair of adults perched.
Trout Creek	3/1	3	Two golden eagles soaring. One immature flying.
Navajo County			
Carrizo Butte	3/13	1	One golden eagle flying high.
Chevelon Creek	3/13	1	One adult flushed from perch.
Pinal County			
Devils Canyon	3/26	1	Adult perched.
Yavapai County			
Black Mountains	3/2	1	One golden eagle flying.
Date Creek Mountains	5/16	1	One golden eagle flew off cliffs.
Hutch Mesa	5/18	2	One adult perched, one flying.
Juniper Mesa	5/15	1	One golden eagle perched.
Mormon Peak Tank	2/28	1	One golden eagle perched on point nearby.
Turret Peak	5/18	2	Pair of adults perched on peak.

BIRD CONSERVATION REGIONS

Although our surveys were based on the need for golden eagle nest data on and adjacent to proposed wind and solar energy projects, management of golden eagle populations is being evaluated by USFWS using Bird Conservation Regions (BCRs) as ecological units. Arizona is approximately divided in thirds by BCR 16, 33, and 34 (NABCI 2000). An insignificant fraction of BCR 35 (Chihuahuan Desert) is represented as well. Surveys in 2012 occurred mainly in BCR 34 (Sierra Madre Occidental) in central and southeastern Arizona, plus smaller portions of BCR 33 (Sonoran and Mohave Deserts) in southwestern and western Arizona and BCR 16 (Southern Rockies/Colorado Plateau) in northern Arizona (Figure 10).

Much of the northern half of BCR 33 was surveyed between 2011-2012, with the largest unsearched areas remaining in the Sonoran Desert on the Yuma Proving Ground, Kofa National Wildlife Refuge, Barry M. Goldwater Air Force Range, and Tohono O'odham Nation. Through the Department of Defense's Legacy Program, AGFD plans on conducting nest surveys and

gathering productivity data on southwestern military lands and overflight areas starting in 2013. This will close in many of the survey gaps in this BCR.

Significant portions of BCR 34 were also surveyed in 2011-2012. Unsearched areas include portions of Prescott, Tonto, Coconino, and Apache-Sitgreaves National Forests, mainly between the Bradshaw Mountains and Sierra Ancha and including the Mogollon Rim north to Sedona, as well as the San Carlos Apache and White Mountain Apache Tribe lands. Through funding provided by Tonto National Forest, we plan on surveying much of that Forest in 2013. Future efforts should also focus on the unsearched “sky island” mountain ranges in the southeast part of BCR 34, as well as the upper Gila, San Francisco and Blue Rivers.

Since tribal lands were excluded from our 2011-2012 survey we spent the least time examining BCR 16, a large component of which is Hopi and Navajo lands, both of whom conduct surveys separate but compatible to ours. Our number of current and historic breeding areas, large nests, and potential breeding areas is correspondingly weighted toward BCRs 33 and 34 (Table 7). Recommendations for future efforts in BCR 16 were outlined in last year’s project report (McCarty and Jacobson 2011).

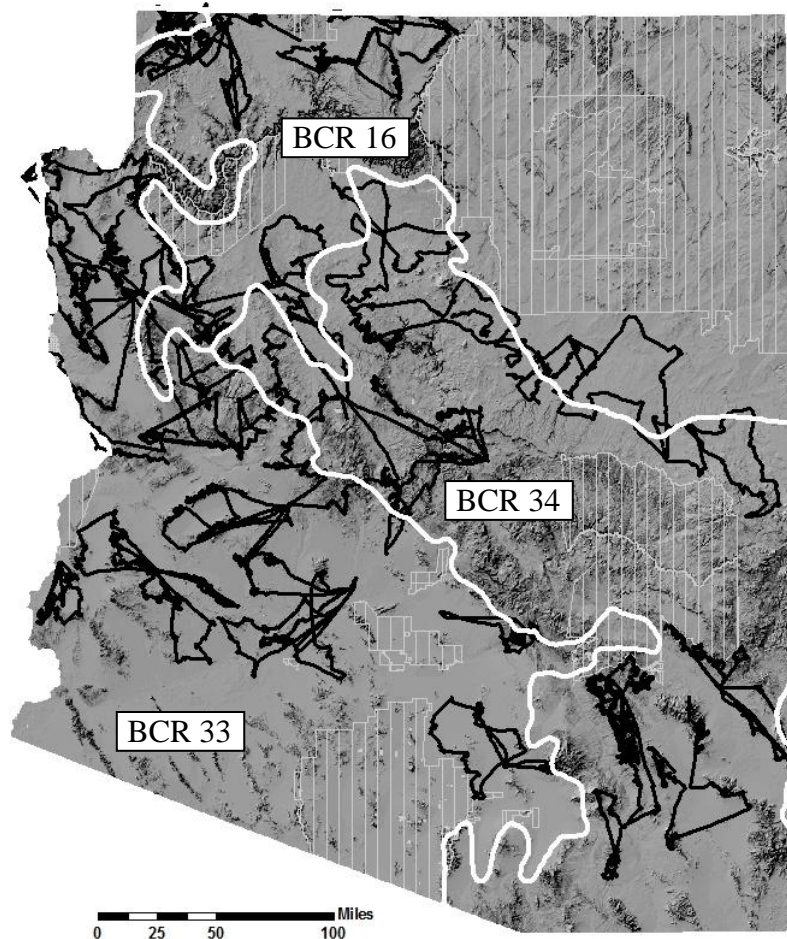


Figure 10. Aerial golden eagle nest surveys completed in 2011 and 2012 (black lines) in relation to Bird Conservation Regions (white lines) and tribe lands (vertical lines).

Table 7. Number of golden eagle breeding areas (BAs), large nests, and potential breeding areas in Arizona by Bird Conservation Region (BCR) as of 2012.				
BCR number	Current BAs	Historic BAs	Large Nests	Potential BAs
16	27*	20	109	70
33	29*	12	213	131
34	54	24	185	126
35	0	1	9	1

*Includes one breeding area shared between BCR 16 and 33.

MANAGEMENT RECOMMENDATIONS

1. Priority areas for future aerial nest inventory surveys include all unexplored suitable breeding habitat and historic BAs within 10 miles of proposed wind and solar projects.
2. Future nest survey efforts should also focus on completing the accessible and suitable habitat within each of Arizona's three main BCR's.
3. Obtain access to Tribal and Department of Defense lands to conduct golden eagle nest surveys in those areas.
4. Once nest inventories are completed, aerial surveys should be used in concert with follow-up ground surveys to document occupancy. From the air, surveyors can easily cover wide areas of golden eagle habitat to examine and discover large nests. From the ground, large nests can be observed for an appropriate duration to determine occupancy. Highest priority for occupancy surveys includes potential BAs where we found a single golden eagle sighted near a large nest, and those areas with multiple large nests in fair to good condition.
5. A representative sample of BA's should be monitored for productivity within each BCR.

LITERATURE CITED

- Braun, C.E., F. Hamerstrom, T. Ray, and C.M. White. 1975. Conservation committee report on status of eagles. *Wilson Bulletin* 87:140-143.
- Brown, D.E. (ed.). 1994. *Biotic Communities, Southwestern United States and Mexico*. The University of Utah Press. Salt Lake City.
- Corman, T.E. and C. Wise-Gervais (Eds.). 2005. *Arizona Breeding Bird Atlas*. Albuquerque, NM: University of New Mexico Press,
- Driscoll, D.E. 2010. Protocol for golden eagle occupancy, reproduction, and prey population assessment. American Eagle Research Institute, Apache Junction, AZ.
- Eakle, W.L., and T.G. Grubb 1986. Prey remains from golden eagle nests in central Arizona. *Western Birds* 17: 87-89.
- Good, R.E., R.M. Nielson, H.H. Sawyer, and L.L. McDonald. 2004. Population level survey of Golden Eagles (*Aquila chrysaetos*) in the western United States. Report prepared for U.S. Fish and Wildlife Service. Western EcoSystems Technology, Inc., Cheyenne, WY.
- Good, R.E., R.M. Nielson, H.H. Sawyer, and L.L. McDonald. 2007. A population estimate for golden eagles in the western United States. *J. of Wildlife Management* 71:395-402.
- Grubb, T.G., and W.L. Eakle. 1987. Comparative morphology of bald and golden eagle nests in Arizona. *J. Wildlife Management* 51:744-748.
- Hoechlin, D.R. 1976. Development of golden eaglets in southern California. *Western Birds* 7:137-152.
- Kochert, M.N., and K. Steenhof. 2002. Golden eagles in the U.S. and Canada: Status, trends, and conservation challenges. *Journal of Raptor Research* 36:32-40.
- Kochert, M.N., K. Steenhof, C.L. McIntyre, and E.H. Craig. 2002. Golden Eagle (*Aquila chrysaetos*). In *The Birds of North America*, No. 684 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.
- McCarty, K.M., and K.V. Jacobson. 2010. Arizona bald eagle management program 2010 summary report. Nongame and Endangered Wildlife Program Technical Report 261. Arizona Game and Fish Department, Phoenix, Arizona.
- McCarty, K.M., and K.V. Jacobson. 2011. Arizona golden eagle nest survey 2011. Nongame and Endangered Wildlife Program Technical Report 267. Arizona Game and Fish Department, Phoenix, Arizona.

- Millsap, B.A. 1981. Distributional status of Falconiformes in west central Arizona, with notes on ecology, reproductive success, and management. U.S. Dept. Interior, Bureau of Land Management Technical Note 355.
- NABCI. 2000. North American Bird Conservation Initiative. Bird Conservation Region descriptions. A supplement of the North American Bird Conservation Initiative Bird Conservation Regions Map.
- Nielson, R. M., T. Rintz, L. McManus, and L. L. McDonald. 2012. A survey of golden eagles (*Aquila chrysaetos*) in the western U.S.: 2011 Annual Report. A report for the U.S. Fish & Wildlife Service. WEST, Inc., Laramie, Wyoming.
- Olendorff, R.R., A.D. Miller, and R.N. Lehman. 1981. Suggested practices for raptor protection on power lines: the state of the art in 1981. Raptor Research Report No. 4, Raptor Research Foundation, Inc., St. Paul, MN.
- Postupalsky, S. 1974. Raptor reproductive success: some problems with methods, criteria, and terminology. In F.N. Hamerstrom, B.E. Harrell and R.R. Olendorff, Eds. Management of raptors. Proceedings of the conference on raptor conservation techniques. Raptor Research Report 2:21-31. Raptor Research Foundation, Inc., Vermilion, SD.
- Postupalsky, S. 1983. Techniques and terminology for surveys of nesting bald eagles. Appendix D in J.W. Grier and others, eds. Northern States bald eagle recovery plan. U.S. Dept. Interior, U.S. Fish and Wildlife Service, Twin Cities, MN.
- Steenhof, K. and M.N. Kochert. 1982. An evaluation of methods used to estimate raptor nesting success. Journal of Wildlife Management. 46(4):885-893.
- Watson, J. 1997. The Golden Eagle. Bath: The Bath Press.
- U.S. Fish and Wildlife Service. 2007a. Protection of eagles; definition of “disturb”. Final rule. Federal Register. 72(107):31132-31140. Department of the Interior, Washington, D.C.
- U.S. Fish and Wildlife Service. 2007b. Endangered and threatened wildlife and plants; removing the bald eagle in the lower 48 states from the list of endangered and threatened wildlife; final rule. Federal Register. 72(130):37346-37372. Department of the Interior, Washington, D.C.
- U.S. Fish and Wildlife Service. 2009. Eagle permits; take necessary to protect interests in particular localities; final rule. Federal Register. 74(175):46836-46879. Department of the Interior, Washington, D.C.
- U.S. Fish and Wildlife Service. (2011). Golden Eagles Status Fact Sheet. Retrieved August 23, 2011 from http://www.fws.gov/habitatconservation/Golden_Eagle_Status_Fact_Sheet.pdf.

APPENDIX A: RAPTOR REPRODUCTIVE STATUS CRITERIA

Breeding Area (BA): An area containing 1 or more nests within the range of 1 mated pair of birds. Operationally, once a BA is established, we consider it a BA whether it is occupied by eagles in a given year or not, until or unless it is designated historical (i.e., 10 consecutive years unoccupied).

Historic BA: A breeding area documented as having been unoccupied for ten consecutive years prior to the current year.

Occupied BA: An occupied BA must have a nest, which is any nest, where at least 1 of the following activity patterns was observed during the breeding season:

- a. Young were raised.
- b. Eggs were laid.
- c. One adult sitting low in the nest, presumably incubating.
- d. Two adults present on or near the nest.
- e. One adult and 1 bird in immature plumage at or near a nest, if mating behavior was observed (display flight, nest repair, copulation).
- f. A recently repaired nest with fresh sticks, or fresh boughs on top, and/or droppings and/or molted feathers on its rim or underneath.

Active Nest: One in which eggs have been laid. Activity patterns (a), (b), and (c) above are diagnostic of an active nest.

Unoccupied BA: A nest or group of alternate nests at which none of the activity patterns diagnostic of an occupied nest were observed in a given breeding season. BAs must exist as occupied before they can be recognized and classified as unoccupied.

Successful BA: An occupied BA from which at least 1 young fledged during the breeding season under consideration. Nests were successful if at least 1 young was raised past 80% of fledging age.

Failed BA: An occupied BA from which no young fledged regardless of cause.

APPENDIX B: POTENTIAL BREEDING AREAS DOCUMENTED IN 2012 NEST SURVEY

Table 8. Summary of potential breeding areas with large nests documented in 2012.				
Area Name	Nest #	Aspect	Elevation (m)	Comments
Apache County				
Concho	1	N/NE	1911	Fair condition.
LCR Becker	1	E	2130	Poor to fair condition.
Cochise County				
Boulder Canyon	1	N	1864	Fair condition. Spilling out. One golden eagle in area.
	2	N	1905	Fair condition.
	3	N	1680	Fair condition.
Bowie Mountain	1	S/SE	1960	Good condition. Nest tucked in recess up high. Well-hidden.
	2	S	1883	Fair condition.
Eagle Peak	1	n/a	1500	Borderline size.
Johnny Lyon Hills	1	n/a	n/a	Fair condition.
Little Dragoon Mts 1	1	n/a	n/a	Fair condition. In large arched cave.
	2	n/a	n/a	Poor to fair condition. Near corner of cliff.
Little Dragoon Mts 2	1	n/a	n/a	Good condition. 3 golden eagles in area (≥ 2 immature).
	2	n/a	n/a	Poor to fair condition. Old.
Little Rincon Mountains	1	n/a	1593	Nice shape.
	2	E	1681	Good condition.
	3	E	1680	Good condition.
Mustang Mountains	1	n/a	1712	Definite eagle size. Nice shape, deep. Low on wall.
	2	n/a	1716	Good shape. Higher.
	3	E	1670	Perhaps borderline size. One golden eagle in area.
	4	E	1640	Old.
	5	N	1623	Old. Second old nest nearby also very poor.
Peloncillo Mountains 1	1	SE	1456	Very old, may have been large once. Second nest in area.
	2	NW	1545	Fair condition.
	3	S/SW	1600	Very old. Not much left.
Peloncillo Mountains 2	1	E/SE	1729	Lots of whitewash. Used recently. One golden eagle in area.
	2	S/SE	1924	Nest in crevice.
	3	S/SE	1672	Whitewash around nest.
	4	E	1856	Definite eagle size. Two nests in close proximity.
	5	N	1800	Nest tucked back in pretty well.
	6	N	1665	Fair condition.
	7	SW	1810	Very old.
	8	E	1864	Two or three medium to large size nests. All old.
	9	n/a	1719	Poor to fair condition.

Table 8 continued. Summary of potential breeding areas with large nests documented in 2012.				
Area Name	Nest #	Aspect	Elevation (m)	Comments
Silver Peak	1	S	1994	Good condition.
	2	n/a	1891	Fair condition. Short cliff, nest on corner facing mountain.
Teran Basin	1	n/a	n/a	Good condition Whitewash around nest, on top of pinnacle-type reef of cliff. Likely RTHA nest.
	2	n/a	n/a	Fair condition. Low on cliff.
	3	n/a	n/a	Fair condition. Medium to large size nest.
Whetstone Mountains 1	1	N	1900	Two nests close. Medium to large size nests.
	2	E	1989	Poor condition, spilling over. Second nest nearby, poor to fair, with whitewash.
Whetstone Mountains 2	1	NE	2125	Poor condition, lacking form, leaning and spilling out. Definite eagle size.
Winchester Mountains 1	1	S	1723	Poor condition, old. Two medium size, good nests on lower set of cliffs.
Winchester Mountains 2	1	S	1701	Good condition. Two nests, large sticks. One above other.
Winchester Mountains 3	1	SW	1806	Poor condition, old. Maybe borderline size.
Coconino County				
Anderson Canyon	1	n/a	1894	Good to very good condition tree nest in Ponderosa pine.
Aubrey Cliffs 1	1	W/SW	2009	Fair condition.
	2	N	2067	Fair condition. On lower cliffs. Also a second very old nest on ledge to left, no sticks.
Canyon Diablo 2	1	W	1808	Good condition. Nest on north side, mid-level.
Canyon Diablo 3	1		1721	Fair condition. Nest spread out on ledge under overhang.
Cataract Canyon North 1	1	N	1699	Fair condition. On west side of canyon. One golden eagle in area.
	2	N/NE	1651	Poor condition. On west side of canyon.
	3	n/a	1663	Poor to fair condition. Borderline size. On west side of canyon.
Cataract Canyon North 2	1	n/a	1671	Poor condition. One golden eagle in area.
	2	n/a	1669	Poor to fair condition nest on ledge under overhang. On east side. Medium to large size.
Chevelon Canyon 2	1	S	1910	Poor condition. North side of creek.
Clear Creek 3	1	W/NW	1662	Fair condition. Mid-height, east side of creek.
	2		1674	Fair condition.
Clear Creek 4	1	N	1697	Fair condition. Two nests, medium to large size.
	2	N	1693	Good condition. East/south side.
Clear Creek 5	1	E/S	1801	Fair condition. West/north side. Lots of whitewash around.
Clear Creek 6	1	N	1978	Poor to fair condition. Two old nests.
	2	N	1941	Poor condition. Very old. On ledge low on cliffs, just above a crack/opening.
Colton Crater	3	E	2171	Fair to good condition.
	4	E	2158	Poor to fair condition. Nest falling apart, sticks below.

Table 8 continued. Summary of potential breeding areas with large nests documented in 2012.				
Area Name	Nest #	Aspect	Elevation (m)	Comments
Elden Mountain	1	n/a	2661	Poor condition. Looked like an old nest but some whitewash present. Hard to judge size, could not fly close.
Government Canyon	1	SW	1524	Fair condition. Tucked in recess, snag sticking out from alcove.
Grapevine 2	1	N	1844	Good condition. South side of canyon.
	2	N	1839	Fair condition. South side of canyon.
	3	N	1835	Fair condition. South side of canyon.
Grapevine 3	1	n/a	1872	Good condition.
	2	N	1871	Good condition. Huge nest on south side of canyon. Possible second nest nearby.
Howard Mesa	1	n/a	2026	Good condition tree nest in Ponderosa pine.
Jacks Canyon 1	1	E/SE	1819	Fair condition. One golden eagle in area.
Little Elden Mountain	1	SE	2632	Very good condition. Looked like an eagle nest. Appeared to be greenery inside.
	2	SE	2628	Fair condition nest on lower cliffs.
Long Point 1	1	SE	1871	Poor condition. One golden eagle in area.
Long Point 2	1	N	1943	Poor to fair condition. One golden eagle in area.
Rattlesnake Wash 1	1	n/a	1857	Borderline size. Good depth but small nest cup.
Red Mountain	3	n/a	2305	Fair condition.
Rhodes Canyon	1	W/NW	1908	good condition.
	2	E/SE	1909	Fair condition. Tucked out of view on ledge.
Spider Web Ranch	2	W	1650	Good nest on very small rock substrate. Seemed unlikely for a golden eagle.
Vineyard Tank	1	SE	1811	Good condition.
Gila County				
East Verde 1	1	n/a	1111	Poor condition, very old. In pothole of cliff.
	2	n/a	1098	Poor condition. Very old.
Hieroglyphic Canyon	1	n/a	1339	Fair condition. One golden eagle in area.
Sandrock Canyon	1	n/a		Fair to good condition. Nest on large cliff-column about halfway up on a ledge. One golden eagle in area.
Graham County				
Diamond Bar Peak	1	E	1537	Poor condition. One large old nest on ledge. Two medium size nests.
	2	S	1579	Poor condition. Old nest low on cliffs. Not used recently.
Dragoon Mountains 1	1	n/a	1713	Poor condition. Old. No shape.
Dry Mountain	1	NW	1289	Fair to good condition.
Galiuro Mts 1	1	n/a	n/a	Fair to good condition. Ledge high.
Galiuro Mts 2	1	n/a	n/a	Fair to good condition. Low ledge.
Galiuro Mts 3	1	n/a	n/a	Fair condition. In alcove, halfway up the face, well-hidden.
	2	n/a	n/a	Fair to good condition. Low on wall.
Galiuro Mts 4	1	n/a	1725	n/a

Table 8 continued. Summary of potential breeding areas with large nests documented in 2012.				
Area Name	Nest #	Aspect	Elevation (m)	Comments
Galiuro Mts 5	1	n/a	1630	Small nest cup and smaller sticks, likely a hawk nest.
	2	n/a	1748	n/a
Galiuro Mts 6	1	n/a	1819	Second nest poor to fair condition lower nearby.
	2	n/a	1882	Nest double-wide.
Galiuro Mts 7	1	n/a	n/a	Good condition.
	2	n/a	n/a	Fair condition.
Galiuro Mts 8	1	n/a	n/a	Poor condition. Three very old nests.
Galiuro Mts 9	1	n/a	n/a	Poor condition. Old.
	2	n/a	n/a	Poor condition. Not maintained.
Galiuro Mts 10	1	n/a	n/a	Poor condition.
Galiuro Mts 11	1	n/a	2034	n/a
Gila Mountains 1	1	SW	1606	Fair condition.
Gila Mountains 2	1	W/SW	1649	Poor condition. Old nest, not much shape. On ledge.
Gila Mountains 3	1	S	1832	Fair condition.
	2	S/SW	1734	Poor condition. Old nest, not maintained.
Gila Mountains 4	1	E	1571	Three large nests, one very large and good, two good condition. Definite eagle size.
	2	E	1538	Good condition. Large nest around corner. Definite eagle size.
	3	SW	1541	Poor to fair condition.
Gila Mountains 5	1	SW	1433	Fair condition. On low cliff face.
	2	S	1491	Fair condition. In recess.
Gila Mountains 6	1	SW	1695	Good condition. Two large nests (high, low). Definite eagle size.
	2	E/SE	1819	Good condition. Good size.
	3	n/a	1823	Good condition. Good size.
	4	n/a	1567	Fair condition. Maybe borderline size.
	5	n/a	1591	Poor condition. Old nest, spilling out.
Gila Mountains 7	1	S	1872	Poor condition. Old nest, tucked in on ledge.
Left Fork Markham Creek 1	1	E/NE	1378	Poor to fair condition.
Left Fork Markham Creek 2	1	W	1472	Good condition.
Oliver Knoll	1	NW	1417	Poor condition. Old.
	2	S	1407	Good condition. Maybe large enough for eagles.
	3	E	1425	Poor condition. Very old.
	4	SE	1515	Poor to fair condition. Two old nests, side by side in separate alcoves.
Santa Teresa Mtns 1	1	SW	n/a	Good condition. On ledge.
	2	n/a	n/a	Fair condition. On S/SW side of large fin cliff.
Santa Teresa Mtns 2	1	n/a	n/a	n/a

Table 8 continued. Summary of potential breeding areas with large nests documented in 2012.				
Area Name	Nest #	Aspect	Elevation (m)	Comments
Santa Teresa Mtns 3	1	n/a	n/a	n/a
Santa Teresa Mtns 4	1	S	n/a	n/a
Santa Teresa Mtns 5	1	n/a	n/a	Poor condition. Small outcrop, tucked back in ledge.
Santa Teresa Mtns 6	1	n/a	n/a	Pothole.
Santa Teresa Mtns 7	1	n/a	n/a	n/a
Santa Teresa Mtns 8	1	n/a	n/a	Good condition. Ledge, overhang.
	2	n/a	n/a	Good condition. Pothole.
	3	n/a	n/a	Fair to good condition. Three nests at various heights.
	4	n/a	n/a	n/a
	5	n/a	n/a	n/a
Slaughter Mountain	1	S	1827	Fair condition. Definite eagle size.
Turtle Mountain 1	1	W	1643	Good condition. Definite eagle size. Second nest on back of butte (nest #2).
	2	E	1732	Good condition. On ledge on back of same mitten-shaped butte nest #1.
	3	W	1872	Good condition.
	4	n/a	1952	Poor to fair condition. Definite eagle size. Old. In alcove in top pocket of canyon.
	5	W	1649	Poor condition.
Turtle Mountain 2	1	n/a	1624	Poor condition.
Whitlock Mountains 1	1	W	1391	Good condition.
	2	W/SW	1448	Fair condition.
Whitlock Mountains 2	1	W	1591	Fair to good condition.
Whitlock Mountains 3	1	W	1462	Four to five old nests on lower ledge and cliff face.
Winchester Mountains 4	1	E	1747	Poor condition. Old.
Winchester Mountains 5	1	N	1606	Good condition. Second older nest lower.
	2	S	1721	Good condition. Definite eagle size. One golden eagle in area.
Yellowstone Canyon	1	W	1490	Two large nests, one good and one poor condition. Definite eagle size. One golden eagle in area.
	2	SW	1495	Fair condition.
La Paz County				
Chocolate Mountains	1	n/a	765	Fair condition. Relatively low, not recently used. One golden eagle in area.
	2	n/a	785	Poor condition. Old nest in alcove, well-hidden, relatively low.
	3	N	790	Poor condition. Old nest in alcove on small peak.
Trigo Mountains 1	1	n/a	644	Very poor, old nest in alcove, good size.
Trigo Mountains 2	1	n/a	686	In alcove/pothole.
YPG 1	1	n/a	559	Fair to good condition. Low cliff.

Table 8 continued. Summary of potential breeding areas with large nests documented in 2012.				
Area Name	Nest #	Aspect	Elevation (m)	Comments
Maricopa County				
New River Mesa	1	S	1269	Poor condition. Might be big enough but not used recently.
New River Mountains 2	1	n/a	1122	Fair to good condition.
Mohave County				
Aquarius Mountains 1	1	SW	1427	Poor to fair condition.
Aquarius Mountains 2	1	W	1418	Good to very good condition. Definitely eagle-sized. On corner of outcrop. One golden eagle in area.
	2	W/NW	1441	Poor to fair condition. Medium to large size.
Aquarius Mountains 3	1	E/SE	1323	Nest in pothole, medium to large, good size.
	2	E	1317	Poor to fair condition. Old nest.
Aquarius Mountains 4	1	N	1416	Fair condition. Ledge in crack/crevice.
Cherokee Point	1	NW	1742	Fair to good condition. One golden eagle in area.
	2	S/SW	1698	Fair condition. Spilling down.
Cottonwood Mountains 1	1	S	1705	Good condition. Medium to large size. Some whitewash.
Grand Wash 5	1	S	1627	Good condition. One golden eagle in area.
	2	W/SW	1580	Nest low on cliff.
Grand Wash 6	1	NW	1499	Good to very good condition. Three large nests on large outcrop. One golden eagle in area.
	2	N	1592	Poor condition. One other medium size nest in area too.
Grand Wash 7	1	NW	1617	Good condition. Very large.
	2	S/SW	1447	Poor condition. Medium to large size.
Grand Wash 8	1	N	1400	Fair condition.
	2	S	1393	Maybe a hawk nest, had smaller-sized sticks.
Indian Head	1	W	1660	Good condition.
	2	SW	1799	Fair to good condition.
	3	W/NW	1721	Fair condition.
Peacock Mountains North	1	E	1482	Good condition. Nest on small outcrop.
Peacock Mountains South	1	SW	1516	Good condition. Definitely eagle-sized.
Penitentiary Mountain	1	W/NW	1429	Good condition. Looked like a new nest built next to an old construction.
Trout Creek 3	1	SE	1258	Fair condition. In pothole near cliff top, north side of creek.
	2	N	1271	Fair to good condition. South side of creek.
Trout Creek 5	1	SE	1487	Good condition. Eagle-sized. Pothole-type ledge.
Valentine	1	W/NW	1440	Good condition.
	2	W/NW	1440	Poor condition.
	3	W	1421	Good condition. Common raven incubating in a large nest, looked like possibly an old eagle nest.
Navajo County				
Black Canyon	2	E	1925	Good condition. Greenery inside nest, looks nice. West side of creek, small cliff/outcrop.

Table 8 continued. Summary of potential breeding areas with large nests documented in 2012.				
Area Name	Nest #	Aspect	Elevation (m)	Comments
Chevelon Canyon 3	1	W	n/a	Fair condition. North/east side.
Chevelon Canyon 4	1	S	1854	Fair condition. North side of creek.
	2	S	1861	Poor to fair condition. Maybe medium size, did not see well.
Chevelon Canyon 5	1	W	1817	Fair to good condition. Medium to large size, smaller sticks.
Chevelon Canyon 6	1	E	1723	Fair condition. One golden eagle in area.
Chevelon Canyon 7	1	W/NW	1710	Fair condition. East side of creek. One large and one small nest. Not maintained.
	2	W/NW	1698	Fair condition. East side of creek. Not maintained.
Clear Creek 2	1	n/a	1593	Poor condition. Medium to large size.
Pink Cliffs 2	1	W	1854	Fair condition.
	2	N	1875	Fair to good condition. Two large nests in proximity, one in decent condition.
	3	W/NW	1868	Poor condition. Older nest.
Pima County				
Buster Mountain	1	SW	1249	Fair condition. Some big sticks.
Cochie Canyon	2	NW	1275	Fair condition. Three large nests close together.
	3	WNW	1239	Fair condition. On corner ledge.
Joaquin Canyon	1	N	2118	Fair condition.
Pusch Ridge Wilderness 1	1	n/a	1859	Good condition.
	2	n/a	1859	Fair condition. Medium to large size.
Pusch Ridge Wilderness 2	1	n/a	1401	Poor condition.
Pusch Ridge Wilderness 3	1	NW	1179	Poor condition.
Ragged Top	1	N	1069	Good condition. Definite eagle size. One golden eagle in area.
	2	n/a	1043	Good condition. Well-hidden pothole.
	3	n/a	1107	Good condition. On ledge in between two peaks.
	4	N	974	Fair condition.
Pinal County				
Aravaipa Canyon 1	1	N	n/a	Good condition. In recess of cliff.
Aravaipa Canyon 2	1	N	n/a	Fair condition.
	2	N	n/a	Fair condition.
	3	N	n/a	Poor to fair condition. Spread out on ledge.
Aravaipa Canyon 3	1	n/a	n/a	Medium to large size. One golden eagle in area.
	2	n/a	n/a	Nest tucked in recessed ledge.
	3	n/a	n/a	Fair condition.
	4	n/a	n/a	Fair condition.
Aravaipa Canyon 4	1	n/a	n/a	Fair condition. Tucked in well. Medium to large size.
Little Table Mtn	1	n/a	n/a	Good condition. Top part of black cliff below main rim cliff. Medium to large size.

Table 8 continued. Summary of potential breeding areas with large nests documented in 2012.				
Area Name	Nest #	Aspect	Elevation (m)	Comments
Mining Mountain	1	n/a	n/a	Fair to good condition. Two nests, empty. Medium to large size.
	2	n/a	n/a	n/a
Picacho Mountains	1	n/a	1064	Good condition. Facing back up mountain on ledge.
	2	n/a	997	Fair condition. Low on cliff wall.
	3	E/NE	1015	Fair condition. Ledge on top of reef.
Picketpost Mountain	1	n/a	996	Fair condition. On large smooth-looking pinnacle.
	2	n/a	1108	Fair condition.
	3	n/a	1084	Poor condition.
	4	n/a	1267	Poor condition.
Ray Mine	1	n/a	1037	Fair to god condition. Medium to large size.
Table Mountain	1	n/a	n/a	Fair condition. Hidden well in alcove.
	2	n/a	n/a	Poor condition. Old.
Teapot Mountain	1	n/a	1310	Fair condition. In alcove, hard to see from most angles.
Wildcat Peak	1	NE	722	Good condition.
Zapata Mountain	1	n/a	n/a	Good condition. Good shape.
	2	n/a	n/a	Fair to good condition. Medium to large size.
	3	n/a	n/a	Fair to good condition. Good size. Another, smaller nest in alcove lower down.
Yavapai County				
Agua Fria 1	1	n/a	1079	Nest on mid-cliff.
Agua Fria 2	1	n/a	1080	Medium to large size.
	2	n/a	1059	Old nest on lower cliffs.
Antelope Creek	1	NW	1628	Small cliffs low in drainage.
	2	SE	1642	At least two large nests on small cliffs.
	3	n/a	1667	Two nests (1-nest materials fallen/spilling out below nest, 2-in alcove below first nest).
	4	n/a	1668	Nest on ledge and hard to see. Some materials below.
Beehive	1	n/a	1599	Nest on ledge about middle of cliff.
	2	n/a	1562	Nest on ledge, looked similar to nest #1.
Big Black Mesa 1	1	n/a	1725	Good condition.
	2	n/a	1720	Fair to good condition.
	3	n/a	1748	Fair condition. Tucked back in between cliff, tough to see.
Big Black Mesa 2	1	n/a	1775	Fair to good condition. Very large nest. Definitely eagle-sized.
	2	n/a	1760	Fair condition. Very large nest in alcove low on cliff.
Big Chino Valley 1	1	S/SW	1831	One golden eagle in area, undulating flight.
	2	W	1866	Good condition. On darker cliffs.
	3	S/SW	1837	Fair condition.

Table 8 continued. Summary of potential breeding areas with large nests documented in 2012.				
Area Name	Nest #	Aspect	Elevation (m)	Comments
Black Canyon Wash	1	SW	905	Good to very good condition. Whitewash around back of nest.
	2	E	955	Fair condition.
Black Mountain Canyon	2	n/a	n/a	Poor to good. Two nests, one nice shape but maybe borderline, 1 very poor).
Burro Creek 2	1	S	1583	Good condition. On high cliff. One golden eagle in area.
Cedar Mesa	1	N/NW	1410	Poor to fair condition.
Copper Mountain	1	n/a	1464	Two nests, possibly large hawk nests.
Cow Creek	1	W	1565	Very good condition. Some whitewash back of nest. Nice nest, eagle-sized.
	2	SW	1553	Poor condition. Not much structure left. Not recently used.
Fossil Pocket	1	n/a	n/a	Fair condition.
Hickey Mountain	1	E/SE	n/a	Poor condition. Ledge low on cliff.
Ives Peak	2	N	934	Poor condition. Old, on ledge. One golden eagle in area.
Juniper Mountains 1	1	E	1767	Fair condition.
	2	E/SE	1779	Fair condition.
Juniper Mountains 2	1	n/a	1743	Poor condition. A mess of nest materials but was once a large structure.
Kirkland Creek	1	N	1030	Fair condition.
Kirkland Peak	1	S	1700	Fair to good condition. On higher part of cliffs, not maintained but large. Some whitewash.
Martin Mountain	1	S	1792	Good condition.
	2	SW	1820	Fair to good condition.
	3	W/SW	1788	Poor condition. Tall nest spilling down, large/old.
Mingus Mountain	1	n/a	n/a	Poor condition. Big enough but old.
New River Mountains 1	1	n/a	1147	n/a
Pilot Knob	1	S/SW	1714	Good condition. Low on cliff in hole, looks nice. One golden eagle in area.
	2	SW	1725	Poor condition. Old nest, not much left on ledge.
Pine Creek	1	N	1611	Good condition.
	2	N/NW	1612	Good condition.
Santa Maria Mountains	1	n/a	2006	Nest on ledge behind small stunted tree, pine greenery in nest, whitewash.
Smith Mesa	1	n/a	1585	Fair condition. Tucked under ledge, whitish cliffs.
South Mesa	1	E/NE	1561	Good condition.
Sullivan Buttes	1	N	1711	Fair to good condition. One golden eagle in area.
	2	E	1724	Fair condition. Possibly too small (smaller sticks).
Sycamore Creek 1	1	W	1302	Good condition. Whitewash at back of nest.
	2	N	1333	Fair condition. Whitewash.
	3	N	1381	Fair condition. Middle cliffs just north of power line.
Sycamore Mesa	1	N	1434	Fair condition. Not maintained.

Table 8 continued. Summary of potential breeding areas with large nests documented in 2012.				
Area Name	Nest #	Aspect	Elevation (m)	Comments
Sycamore Wilderness 1	1	NE	1426	Good condition. High. Tucked in corner of wall. Whitewash in back of nest.
	2	W	1780	Fair condition. High, under overhang.
	3	N/E	1426	Poor condition, old. Low. Not used recently.
Trout Creek 4	1	N	1494	Good to very good condition. Whitewash around nest, middle height of cliff.
Ward Pocket	1	n/a	n/a	Good condition. Some greenery inside.
Weaver Mountains 1	1	n/a	1761	Large sticks, tucked away and hard to see.
West Clear Creek 2	1	n/a	n/a	Good condition. Medium to large size. Nest big enough but possibly a hawk nest.
West Clear Creek 3	1	n/a	n/a	Poor condition. Old nest in alcove, spread thin.